Grand Canyon

National Park Service
U.S. Department of the Interior

Grand Canyon National Park

Environmental Assessment

June 2003

Yavapai Observation Station Rehabilitation

Grand Canyon National Park • Arizona

Environmental Assessment

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Public Comment

This environmental assessment will be on public review for 30 days. If you wish to comment on the environmental assessment, you may mail comments to the name and address below, no later than **July 21, 2003.** Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please Address Comments to:
Joseph F. Alston, Superintendent
Attention: Sara White, Compliance Officer
Grand Canyon National Park
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1 Village Loop
Grand Canyon, Arizona 86023

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Chapter 1 – Project Scope

INTRODUCTION

The purpose of this document is to disclose the expected effects to the human environment of various components of the proposed Yavapai Observation Station rehabilitation project. The human environment is defined as the natural and physical environment and the relationship of people with that environment. The building, eligible as a National Historic Landmark, is located on the South Rim of Grand Canyon National Park in Coconino County, Arizona. The proposal includes both interior and exterior rehabilitation. All efforts are designed to preserve historic features and elements of the building while improving functionality, safety, and accessibility for users. Ground disturbing activities are minimal and are focused on the immediate area surrounding the building. This project is located within the Rowe Well watershed. For further reference, see the project vicinity map on the next page.

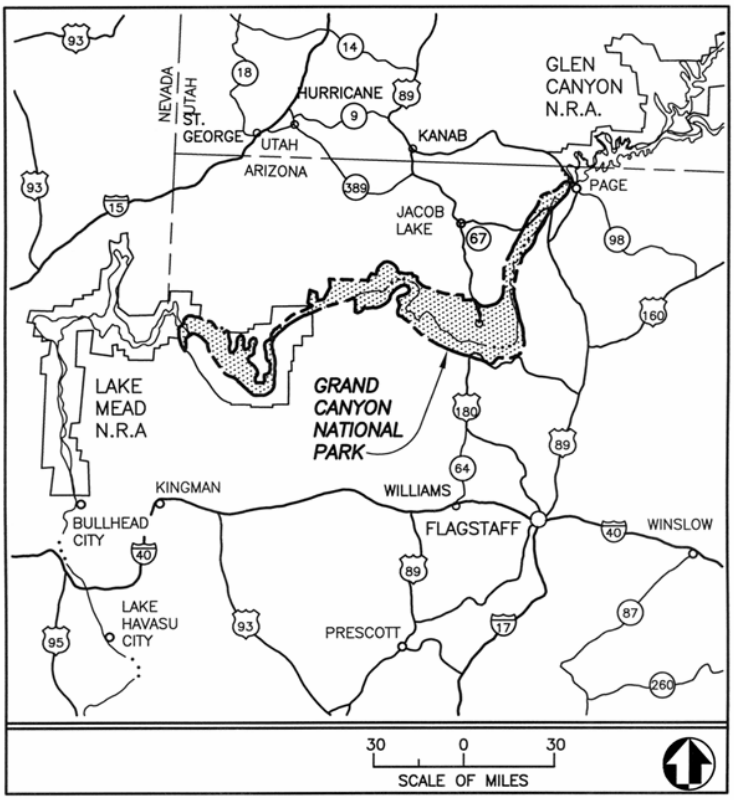
PURPOSE AND NEED FOR ACTION

Yavapai Observation Station was originally built in 1928 for the purpose of observing and understanding the geology of the Grand Canyon. It is one of the earliest park museums and is of national significance in National Park Service (NPS) architecture and interpretation. The approximately 3,000 square foot (SF) building is included on the NPS List of Classified Structures and was listed on the National Register of Historic Places in 1990. The building is considered eligible for listing as a National Historic Landmark.

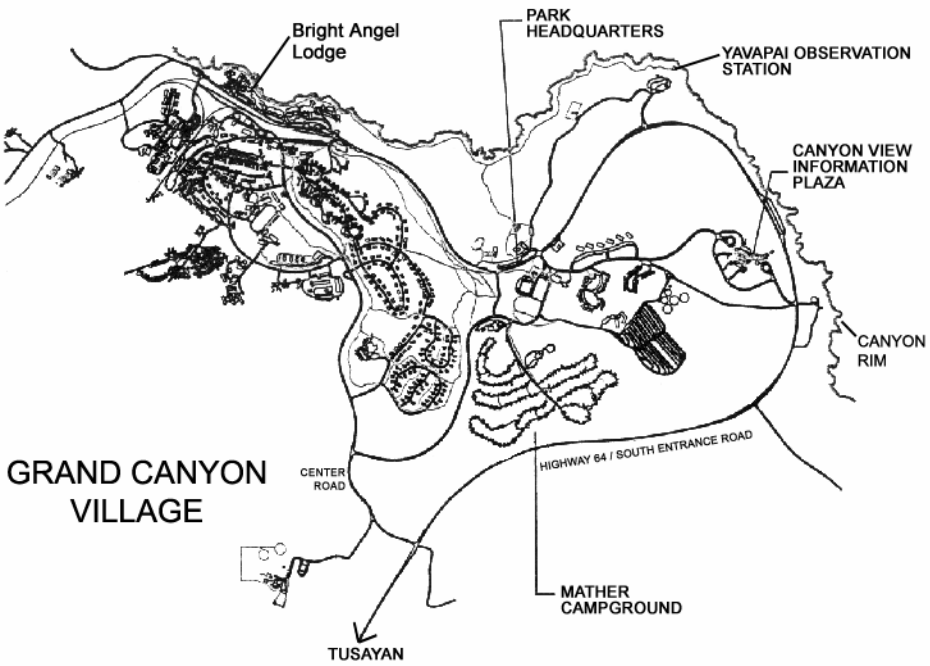
Grand Canyon Association is currently using Yavapai Observation Station as a bookstore and observatory. While some alterations to the building have occurred over time, the design intent, overall character, and integrity are still evident and intact. These alterations include the installation of tinted windows on the observation deck, removal of the "geologic" masonry wall separating the former museum and open viewing area, excess and obsolete exterior utilities, accumulated equipment on the roof, and worn paving stones, among others. The building continues to maintain a similar function to its historic use as a wayside observatory and geologic museum and is in fair condition.

The heating and cooling systems in the building are inadequate. Originally an open-air structure, the enclosure of the observation deck with glazing in 1953 eliminated a major source of natural ventilation. The glass enclosure causes the building interior to heat up significantly during the warm sunny weather and current ventilation is inadequate to exhaust the accumulated heat (ARG 2001).

The proposed action is consistent with the 1995 Grand Canyon General Management Plan (GMP), NPS Management Policies (2001), NPS Director's Orders, and other applicable laws and regulations, and rehabilitation efforts would allow Yavapai Observation Station to function as intended in the GMP.



Grand Canyon National Park
Project Vicinity
Figure 1



The GMP (NPS 1995) identifies Yavapai Observation Station as an interpretive facility, and discusses its function several times:

> Page 32: "Interpretive exhibits at the Yavapai Observation Station and Tusayan Museum will be simplified to focus on only selected themes, and related outdoor exhibits will be expanded. The Yavapai Observation Station will primarily be for viewing the canyon, with a few exhibits on geology, physiography, and related topics."
>
> Page 30: "…an outdoor exhibit will be provided at the Yavapai Observation Station. Interpretive exhibits focused on particular themes will be provided at the existing powerhouse in Grand Canyon Village, the Yavapai Observation Station, and the Tusayan Museum."
>
> Page 31 and Page 38 maps: Identify Yavapai Observation Station as a Museum/Interpretation Facility

The proposed project is needed to address the following management concerns:

- The building does not have a fire detection or sprinkler system and is not in full compliance with accessibility standards or building codes.
- The building exterior, including log viga ends, roof, native stone masonry, trim and woodwork is deteriorated and in need of repair. Unnecessary equipment on the roof and obsolete exterior utilities detract from the building's historic character, and need to be removed when possible.
- The building interior, including paint, flooring, windows and doors, is in need of repair.
- The existing heating and cooling systems are inadequate. Temporary solutions for cooling the building have been implemented, but a permanent solution is necessary.
- The functions for Yavapai Observation Station as identified in the 1995 GMP are not being met. The facility is primarily used a bookstore with only limited interpretive exhibits.
- Small access barrier (uneven surfaces and paving irregularities) around the exterior of the building needs to be eliminated.

Objectives of the Action

1) Implement direction outlined in the 1995 GMP for Yavapai Observation Station to function as a museum/interpretive facility, focusing on geology, physiography and related themes.
2) Comply with the most recent accessibility guidelines when rehabilitating the building.
3) Comply with the most recent building codes, fire codes and life safety standards when rehabilitating the building.
4) Preserve the historic features and character-defining spaces and elements, while improving the functionality and safety of the building for current uses. Modifications to the building will be done in a manner that will minimize negative physical and visual effects to the cultural resource.

MANAGEMENT AND PLANNING HISTORY

National Park Service Management Policies (2001) is the guiding document for management of all national parks within the national park system. As stated in the introduction, "It (NPS Directives System) is designed to provide NPS management and staff with clear and continuously updated information on NPS policy and required and/or recommended actions, as well as any other information that will help them manage parks and programs effectively." Among direction on all aspects of park management, these Management Policies set forth direction for each unit of the national park system to maintain an up-to-date General Management Plan. Chapter 9–Park Facilities and Chapter 5-Cultural Resource Management are also applicable to this project.

Grand Canyon National Park is currently operating under the direction of the *1995 General Management Plan* (GMP). This plan provides guidance for resource management, visitor use, and general development for a period of 10 to 15 years. The primary purpose of the Plan is to provide a foundation from which to protect park resources while providing for meaningful visitor experiences. Yavapai Observation Station is located near Grand Canyon Village and is part of a Development Zone, which prescribes the area to provide and maintain facilities for serving park managers and visitors. For ease of reference, Appendix A contains excerpts of the pertinent sections of the GMP that apply to this project.

An interdisciplinary team discussed potential issues with building rehabilitation during a Value Analysis/Choosing by Advantages (CBA) study in June 2001. The use of a CBA protocol when evaluating the merits of large projects is a National Park Service mandate. This is a systematic approach to evaluating alternatives in context with the value of identified issues, concerns, and functions. A Historic Structure Report (ARG 2001) was prepared to assist in the development of recommendations for appropriate treatments. The Historic Structures Report (HSR) identified basic rehabilitation needs for Yavapai Observation Station, as well as several alternatives for the treatment of the single-pane windows (glazing) on the observation deck. The June 2001 Value Analysis focused on several options for the treatment of the glazing on the observation deck. The enclosure of the original open-air observation deck (Figure 2) with five large single pane picture windows occurred in 1953. The cantilever roof was cut back and a concrete cap on the guardrail wall was placed to accommodate the windows (Figure 3). The park wanted to explore options for treatment of these windows. Preliminary scoping to identify concerns of additional Park Service specialists with the rehabilitation proposal occurred in May and June 2001, with further input received in September and October 2001.

The Yavapai Observation Station rehabilitation proposal was included in a public scoping letter that was submitted to a 300-person Grand Canyon National Park mailing list on October 24, 2001. The purpose of the scoping letter was to describe the proposed action to any interested/affected parties and solicit comments from those who may have issues with the proposed action. A press release was also issued on October 25, 2001 and the scoping letter was posted on the park's website on October 25, 2001. From these public scoping activities four letters were received. These included a letter from the Navajo Nation Historic Preservation Department, The Zuni Heritage and Historic Preservation Office, the Hopi Tribe Cultural Preservation Office and a private individual (see Chapter 5). These responses either offered no specific comment on the proposal and thanked the park for keeping them informed, or were in support of the proposal as described. The Park Service performed a content analysis on this information, information gained from internal scoping, and information gained from scoping with other agencies. From this effort, the Park Service did not identify any additional significant issues for analysis.

Figure 2. Yavapai Observation Station, showing open observation deck (GRCA archives).

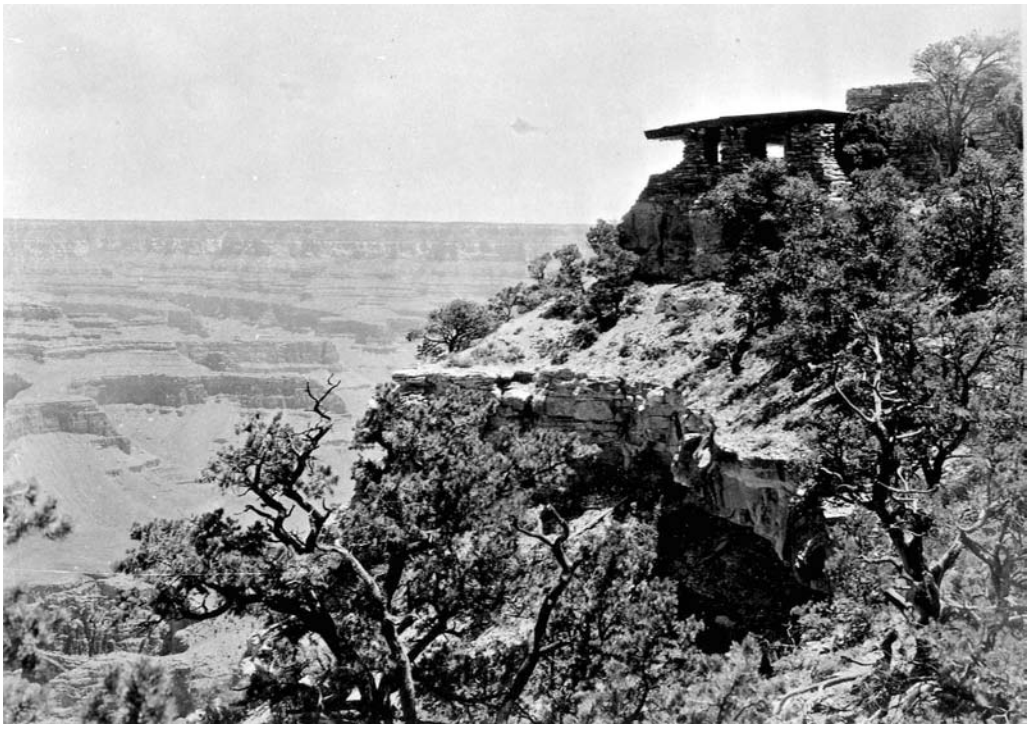


Figure 3. Yavapai Observation Station, showing enclosed observation deck (GRCA archives).

The Park Service met on December 13, 2000 with U.S. Fish and Wildlife Service and Arizona Game and Fish Department personnel to discuss this project proposal and other future proposals. The USFWS also responded with a list of threatened, endangered or proposed species that may have the potential to occur in the area on November 7, 2001. The potential for adverse impacts to federally listed species has been consulted on with the U.S. Fish and Wildlife Service (USFWS). USFWS concurred with the park's determination that implementation of this project, along with many other construction projects in the park over the next five years, may affect, but is not likely to adversely affect, the Mexican spotted owl or the California condor or their habitat (USFWS letter July 9, 2002).

Consultation between the National Park Service (NPS) and the State Historic Preservation Officer (SHPO) on this project is on-going. SHPO was a key team member during the Value Analysis in June 2001. SHPO has concurred with the park's preliminary determination that implementation of this project would result in a no adverse effect determination to historic resources on 12 December 2001. Additional discussions regarding this project occurred on 16 – 17 October 2002, 18 December 2002, and 20 February 2003. Full documentation of the assessment of actions having an affect on cultural resources, or the Assessment of Effects form (AEF), will be prepared separately for this project, to facilitate continued consultation with the SHPO. For ease of reference, the cultural resources section of this Environmental Assessment provides a summary of the information documented in the associated AEF.

ISSUES AND IMPACT TOPICS

Various agencies have been contacted and consulted as part of this environmental analysis. Appropriate federal, state, and local agencies have been contacted for input and review (see Chapter 5 for a list of persons contacted). National Park Service specialists, with input from federal, state, and local agencies identified issues and concerns (i.e. impact topics) affecting this project. After public scoping, issues and concerns were distilled into distinct impact topics to facilitate the analysis of environmental consequences, which allows for a standardized comparison between alternatives based on the most relevant information.

An issue is an effect on a physical, biological, social, or economic resource. The predicted effects of an activity create the issue. Issues may come from the public, from within an agency or department, or from another agency (Freeman and Jenson 1998). For this project, issues with various proposed alternatives were identified by the interdisciplinary team and were brought forward by other agencies. No additional issues came forward through public scoping. Once issues were identified, they were used to help formulate alternatives and mitigation measures. Impact topics were then selected for detailed analysis based on substantive issues, environmental statutes, regulations, executive orders, and *NPS Management Policies* (2001). A summary of some of these compliance-related laws and regulations is provided in Appendix B. A summary of the impact topics and rationale for selection/dismissal are given below.

Impact Topics Dismissed from Further Analysis

Soils and Water – The project area is located within the Rowe Well watershed. There is no standing water or any major or minor drainage in the project vicinity. There is no riparian habitat present within or adjacent to the project area. The Grand Canyon Village area is characterized by the absence of surface water, which generally drains through the ground water system or returns to the atmosphere via evapotranspiration. Surface runoff usually only

occurs following severe storm events. This is largely due to the permeable nature of the upper sedimentary layers underlying Grand Canyon Village area (NPS 1995c, Roundy and Vernon 1996) and the evapotranspiration potential of the surrounding pinyon-juniper vegetation type (Huntoon undated).

Proposed construction would involve only minimal soil disturbance. The project components focus on the interior and exterior of the building itself and would not result in substantial soil disturbance outside of the immediate area surrounding the building. Some trenching will be necessary on site to replace underground utility lines, bury other communication cables, and to repair and replace walkways (confined to the area immediate area surrounding the building and the area between the building and the parking lot, estimated at less than 0.25 acres). This type of activity has the potential to disturb soil and has the potential to result in impacts to soil and water resources through removal of live vegetation and exposing and compacting bare soil. This can, in turn, sometimes increase surface runoff and erosion and/or subsurface flow to a downstream channel, depending on the amount of disturbance. Increased runoff can result in on-site surface erosion problems or downstream water yield increases which could result in increased peak flows and higher sediment loads in some situations. Higher sediment loads can cause accelerated channel erosion, sedimentation, and flooding in downstream channel systems (Lovely 1991). However, due to the limited size and extent of the ground disturbance proposed for this project, the fact that the area is located within the developed zone of the South Rim, and the adherence to mitigation measures designed to minimize the potential for soil movement off-site during project implementation, project implementation would result in an overall negligible impact to soil and water resources. Effects would last only as long as construction activities occurred. For these reasons, soils and water were dismissed from further analysis.

Vegetation - Proposed building rehabilitation would not result in any substantial disturbance of existing vegetation communities in the surrounding area. The proposed work focuses on the interior and exterior of the building and the site immediately around the building. While some minor tree removal or tree pruning may be necessary in areas adjacent to the building, in part to maintain the view of the canyon from the Observation Station, the extent of this would be minor and would be done in consultation with the Park's Vegetation Program Manager. A few shrubs may be removed to connect a new waterline with the existing underground system and a small pinyon pine tree (less than seven inches in diameter at breast height, DBH) would be removed to maintain the view from the east vestibule. Work, however, would be confined to a limited area and mitigation measures, such as following the Park's pruning guidelines and consulting with vegetation specialists, would be implemented. Mitigation measures would also be followed to minimize the potential for introduction and/or spread of exotic vegetation and noxious weeds (Chapter 2). For these reasons, this topic was dismissed from further analysis.

General Wildlife Populations/Species of Interest: The South Rim provides habitat for a wide variety of wildlife species. Mammals typically associated with ponderosa pine and juniper/woodland vegetation on the South Rim include species such as elk, ground squirrels, Abert's squirrels, deer mice and several bats. Birds include common raven, black-throated gray warbler, gray flycatcher, stellar's jay, pinyon jay, western tanager and pygmy nuthatch. Reptiles include western rattlesnake, short-horned lizard and mountain skink (Brown 1994). Those species that are not special status species, but for which there is interest and concern for their populations on the South Rim, are listed in Table 1 and discussed briefly below. This list was developed based on input from Park biologists, Arizona Game and Fish Department biologists, and U.S. Fish and Wildlife Service biologists.

Table 1. Species of Interest on the South Rim.

Common Name	Scientific Name
Mule Deer	*Odocoileus hemionus*
Merriam's Turkey	*Meleagris gallopavo merriami*
Desert Bighorn Sheep	*Ovis canadensis*
Mountain Lion	*Felis concolor*
Rocky Mountain Elk	*Cervus elaphus nelsoni*
Bats	*Various species*
Breeding Birds	*Various species*

Ponderosa pine and pinyon/juniper woodland habitats of the South Rim provide habitat for many species, including those listed in Table 1. The proposed Yavapai Observation Station Rehabilitation project would occur in habitat suitable for all those species listed in Table 1. However, due to the fact that the building occurs within the developed area of the South Rim and existing use by visitors and employees in this area would continue to be high during all seasons, the project area does not provide key habitat for these species. It is likely that these species may be encountered in and near the building occasionally, but it is not considered essential habitat for these wildlife species. Exceptions to this include mule deer (a resident herd is present year round in the developed areas of the South Rim due to abundant forage around facilities and residences), elk to a lesser extent (for the same reasons as for deer) and mountain lion. Recent research conducted by a park wildlife biologist demonstrates that lions frequent the developed areas of the South Rim, where adequate cover exists, and prey species (such as resident deer, elk, and house pets) are abundant (E. Leslie, pers. comm. 11/01).

Therefore, due to the limited scope of the project, the lack of habitat manipulation, and distance from breeding areas, this project is not expected to impact general wildlife populations, populations of breeding birds, or species of interest on the South Rim. While short-term impacts from increased noise and human presence in the project area would result during the construction period, these impacts are expected to be short-term, localized and negligible. For these reasons, this topic was dismissed from further analysis.

Air Quality - Clean, clear air is essential to preserve the resources in Grand Canyon National Park, as well as for visitors to appreciate those resources. Grand Canyon National Park is a federally mandated Class I area under the Clean Air Act. As such, air in the Park receives the most stringent protection against increases in air pollution and in further degradation of air quality related values. The Act then sets a further goal of natural visibility conditions, free of human-caused haze. Air quality in the Park is generally quite good. Pollution levels monitored in the Park fall below the levels established by the Environmental Protection Agency to protect human health and welfare. However, the ability to see through the air (visibility) is usually well below natural levels because of air pollution. Most of this pollution originates far outside the Park's boundaries, and arrives in the Park as a well-mixed regional haze, rather than as distinct plumes.

Section 118 of the Clean Air Act requires all federal facilities to comply with existing federal, state, and local air pollution control laws and regulations. The scope of this project will not

require consultation with the State of Arizona regarding air quality. Because there is some ground disturbance involved, there is a possibility of raising nuisance dust during project implementation or from disturbed areas afterwards. After project completion, building and paving footprints would address dust there. Revegetation of the site, after work is complete, would provide long-term dust control. Mulch and the plants themselves would stabilize the soil surface and reduce wind speed/shear against the ground surface.

Trenching and other minor on-site work would increase dust and combustion-related emissions. Dust raised during construction activity would be limited by the size of the project and the equipment used. By clearly marking boundaries of the project area, unnecessary soil disturbance, and consequent dust generation, would be avoided. Water sprinkling can control fugitive dust emissions from light traffic in the project area. Construction equipment itself can adversely affect air quality by exhaust emissions. Minimizing the extent to which construction equipment idles would help to reduce this effect. Minimizing idling would also help to reduce noise impacts during construction as well.

The Yavapai Observation Station is in a highly used development zone. Rehabilitation efforts maintain the existing configuration of the building and the site and essential functions in their current location. Thus, indirect air quality impacts from routine daily vehicle emissions for visitors, employees and official business would be unchanged.

Therefore, local air quality may be temporarily degraded by dust generated from construction activities under the action alternative, and emissions from construction equipment. This degradation would result in an overall negligible impact to air quality, and would last only as long as rehabilitation activities occurred. Impacts to overall park air quality or regional air quality are not expected. For these reasons, air quality was dismissed from further analysis.

Soundscape - The NPS is mandated by Director's Order 47 to articulate the Park Service's operational policies that would require, to the fullest extent practicable, the protection, maintenance, or restoration of the natural soundscape resource in a condition unimpaired by inappropriate or excessive noise sources. Natural sounds are intrinsic elements of the environment that are often associated with parks and park purposes. They are inherent components of "the scenery and the natural and historic objects and the wild life" protected by the NPS Organic Act. They are vital to the natural functioning of many parks and may provide valuable indicators of the health of various ecosystems. Intrusive sounds are of concern to the NPS because they sometimes impede the Service's ability to accomplish its mission.

Rehabilitation activities would generate noise levels in the vicinity above the ambient conditions. Noise sources include vehicles and power tools. To protect the Park soundscape during project implementation, noise production must occur outside the curfew established for overflights, as listed in the mitigation measures developed for this project. Noise impacts from this project would only last the duration of the construction. After construction is completed, any noise level impacts would return to their natural condition. All construction would occur during daylight hours when roads and the associated traffic already affect the project area. Any additional traffic would only be temporary and would negligibly affect the areas in the short-term. Since this project would have no measurable impacts on the long-term soundscape in the project area, soundscape was dismissed from further analysis.

Floodplains and Wetlands - Executive Order 11988 (Floodplains) and Executive Order 11990 (Wetlands), which require federal agencies to examine the potential impacts of actions

on floodplains and wetlands, were reviewed for applicability to this project. Because the project is not in or near a floodplain or wetland and would not affect this resource, floodplains and wetlands were dismissed from further analysis.

Cultural Resources (Archeological, Ethnographic, Cultural Landscapes, Museum Collections) – Ground disturbing activities have the potential to affect cultural resources. Relatively recent comprehensive archeological surveys have occurred in Grand Canyon Village and surrounding areas as part of project clearances including prescribed burns, proposed light rail corridor, utility corridor, and Mather Point Orientation Center, now referred to as Canyon View Information Plaza (Moffitt et al. 1998 and Fairley 1995). Typical archeological properties documented as part of these more recent surveys include prehistoric lithic prospects, quarries, retooling sites, and temporary shelters. Isolates recorded included both prehistoric and historic artifacts. The project area has been surveyed and no archeological sites near the Yavapai Observation Station were discovered as a result of these surveys. Previous surveys adjacent to or overlapping the project area include Balsom (1987), Moffitt and Moffitt (2001) and Moffitt, Moffitt, Horn-Wilson and Schroeder (2000).

Consultations with American Indians are also required for compliance with a variety of laws and other legal entities, such as presidential executive orders, proclamations, and memoranda; federal regulations; and agency management policies and directives. Examples are the Indian self-determination and Education Assistance Act (1975); The American Indian Religious Freedom Act (1978 and as amended in 1994); the native American Graves Protection and Repatriation Act (1990); National Historic Preservation Act (as amended in 1992); the Presidential Memorandum of April 29, 1994, entitled "Government-to-Government Relations With Native American Tribal Governments; and Executive Order 13007 of May 24, 1996, entitled "Indian Sacred Sites."

Native American use of the general area is known in general terms from ethnographic accounts and on-going consultation with the nine affiliated tribes of Grand Canyon. No specific references have been identified specifically for the Yavapai Observation Station area. Consultations with those tribes interested in projects occurring on the South Rim were conducted for this project during the scoping period in October 2001 (see Chapter 1, page 4 and Chapter 5). Letters were received from three of these tribes (Hopi, Navajo, and Zuni). The Navajo Nation and the Zuni Heritage and Historic Preservation Office had no concerns with the project as described. The Hopi Tribe requested information on prehistoric cultural resources in the area, if they may be affected by implementation of the project.

The National Park Service's Management Policies 2001 and Director's Order 28, Cultural Resource Management Guideline (1997) require consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material). Yavapai Observation Station does not currently function as a museum and does not contain any museum collections at this time. All Grand Canyon National Park museum collections are housed in a separate building, specifically designed for retaining these types of collections. While the observation station would function primarily as an interpretive facility following proposed rehabilitation and installation of new exhibits, it would not house any museum collections. Interpretive themes would focus on geology and may contain replicas of fossils, but would not contain any articles from the museum collection.

Direct and indirect impacts to archeological, ethnographic, cultural landscape resources and museum collections are not expected from implementation of this project. No archeological sites have been located within the boundaries of the project area, no sites are in close proximity to the project area and no sites have been documented in or near the sites proposed

for use as staging. The majority of the project would be occurring interior to the building, on the building itself, or directly adjacent to the building. Staging areas are existing disturbed sites, one which is already paved and one which is dirt, but previously disturbed. Ground disturbance is minimal and would primarily occur on areas already disturbed (existing walkways, etc.) and previously surveyed for archeological sites. Implementation of mitigation measures (Chapter 2, pages 16-17) should help ensure that impacts to archeological resources do not occur. Affiliated tribes have been contacted and no ethnographic resources have been identified in the project area. No changes to the surrounding cultural landscape would result from the project since it involves rehabilitation of the existing building with little change in outward appearance or circulation patterns. Yavapai observation station does not house any museum collections at this time and this would also be the case following rehabilitation. For these reasons, archeological, ethnographic, cultural landscape resources and museum collections were dismissed from further analysis.

Environmental Justice - Executive Order 12898 requires consideration of impacts to minority and low-income populations to ensure that these populations do not receive a disproportionately high number of adverse or human health impacts. This issue was dismissed from further analysis for this project because each alternative would affect everyone equally and would not disproportionately impact minority or low-income populations.

Prime and Unique Farmland - The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in conversion of these lands to non-agricultural uses. Prime or unique farmland is defined as soil that particularly produces general crops as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables and nuts. The project locations and surrounding lands have been evaluated by appropriate park technical area specialists and by specialists from the Natural Resources Conservation Service (NRCS). Based on their observations, the project area is not considered prime or unique farmland (Camp, Natural Resources Conservation Service, pers. comm. 2002). Therefore, this topic was dismissed from further analysis.

Socioeconomic Environment – Socioeconomic values consist of local and regional businesses and residents, the local and regional economy and park concessions. The local economy and most business of the communities surrounding the park are based on construction, recreation, transportation, tourist sales, services, and educational research; the regional economy is strongly influenced by tourist activity. The GMP EIS discussed the socioeconomic environment and impacts extensively. There may be short-term benefits to the local and regional economy resulting from construction-related expenditures and employment. Local and regional businesses would be negligibly affected in the long-term. Grand Canyon Association (GCA) operates a bookstore outlet at Yavapai Observation Station. GCA is not a business per-se, but is rather a non-profit cooperating association and supports the educational, scientific, historical and interpretive activities of the National Park Service, Grand Canyon National Park. All profits from the sale of these educational resources for visitors come back to the Park. For these reasons, GCA is not considered a business in terms of considering impacts to the local economy. While GCA's operation at Yavapai Observation Station would be closed during the construction period and their bookstore substantially reduced in the new facility, no changes in staffing or infrastructure for this operation is expected. While there is likely to be a reduction in bookstore sales after reopening, this would be ameliorated by book sales in other GCA operations in the Park, such

as at Canyon View Information Plaza. Therefore, impacts, both adverse and beneficial, would be negligible. For these reasons, socioeconomic values were dismissed from further analysis.

Relevant Impact Topics

Cultural Resources (Historic Properties) - The National Historic Preservation Act, as amended in 1992 (16 USC 470 *et seq*.), and the National Environmental Policy Act, as well as the National Park Service's Director's Order-28, *Cultural Resource Management Guideline (1994*), *Management Policies* (2001), and Director's Order-12, *Conservation Planning, Environmental Impact Analysis and Decision-making* (2001), require the consideration of impacts on cultural resources either listed in or eligible to be listed in the National Register of Historic Places. Section 106 of the National Historic Preservation Act of 1966 requires that federal agencies having direct or indirect jurisdiction over undertakings consider the effect of those undertakings on properties on or eligible for listing on the National Register of Historic Places and afford the Advisory Council on Historic Preservation and the state historic preservation office an opportunity to comment. Yavapai Observation Station is listed in the National Register and is eligible for designation as a National Historic Landmark. This topic will be discussed in Chapter 3.

Special Status Wildlife Species – The U.S. Fish and Wildlife Service (USFWS) has determined that several threatened, endangered and proposed species have the potential to occur in Coconino County. The Arizona Game and Fish Department has determined that several other special status species should also be considered for projects occurring in Coconino Country. Representatives from both agencies also met to discuss this and other Park projects in December 2000. The information provided was used to develop a list of species of concern in the project area. NPS also discussed this project with the USFWS during the preparation of the Parkwide Construction Program Batch Biological Assessment during March – June 2002 (NPS 2002). Chapter 3 discusses these species and the potential for effects to wildlife. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. This topic will be discussed in Chapter 3.

Visitor Experience – Yavapai Observation Station is a destination point for many park visitors and is a common stop for commercial bus tours and school groups. The building is located in a prime location for viewing the canyon and offers visitors information about the Park, book sales, and restroom facilities. Rehabilitation of the building to further implement GMP direction to return this facility to a museum and key interpretive facility will have impacts to visitor experience both during the construction period and after completion. No commercial bus/tour operators will be allowed to stop at Yavapai Observation Station during the construction period. These topics will be discussed in Chapter 3.

Park Operations – The building rehabilitation is designed to improve safety, functionality and accessibility of the building. These improvements would benefit visitors, park staff and GCA employees who work in the building. Re-design of interior space and improvements in mechanical and safety systems will improve operational efficiency. This topic will be discussed in Chapter 3.

ADDITIONAL NEPA ANALYSIS

The proposed alternatives include all reasonably foreseeable connected actions. Environmental effects estimated for this project consider the site-specific effects of all foreseeable actions and mitigation measures. Monitoring during and following implementation of the project would occur to verify effectiveness of mitigation measures and predictions of impact. This EA will guide any subsequent project implementation. If new information or unforeseen and unanalyzed actions become necessary in the future, additional site-specific environmental analysis will be conducted before implementation.

Chapter 2 – Alternatives

INTRODUCTION

This section describes two management alternatives for this project. In developing alternatives for this project, some actions were considered and subsequently dismissed. This chapter contains a section that describes alternatives that were considered but eliminated from detailed analysis and the reasons for their elimination. A summary table comparing alternative components is presented at the end of this chapter.

The preferred alternative is based on preliminary designs and best information available at the time of this writing. Specific distances, areas, and layouts used to describe the alternatives are only estimates and could change during final site design. If changes during final site design were not consistent with the intent and effects of the selected alternative, then additional compliance would be needed as appropriate.

ALTERNATIVE DEVELOPMENT

Various alternative treatment options were evaluated for addressing some of the key management concerns for this project. As stated in Chapter 1, this project is needed to address the following management concerns:

- The building does not have a fire detection or sprinkler system and is not in full compliance with accessibility standards or building codes.
- The building exterior, including log viga ends, roof, native stone masonry, trim and woodwork is deteriorated and in need of repair. Unnecessary equipment on the roof and obsolete exterior utilities detract from the building's historic character, and need to be removed when possible.
- The building interior, including paint, flooring, windows and doors, is in need of repair.
- The existing heating and cooling systems are inadequate. Temporary solutions for cooling the building have been implemented, but a permanent solution is necessary.
- The functions for Yavapai Observation Station as identified in the 1995 GMP are not being met. The facility is primarily used a bookstore with only limited interpretive exhibits.
- Small access barrier (uneven surfaces and paving irregularities) around the exterior of the building needs to be eliminated.

Bullet items one and two above are addressed by actions proposed in the preferred alternative, as described later in this Chapter. No alternative methods other than those proposed were considered for repair of these building components.

Many of the interior elements mentioned in bullet item three are also addressed in the preferred alternative, with minimal need to look at alternative treatments. However, the evaluation of options for treatment of the observation deck windows, other windows in the building and doors did occur and is described briefly in the next section.

In order to address bullet item four, options for forced air heating and cooling and natural ventilation were explored. These alternatives for HVAC are described briefly in the next section.

Bullet item five is primarily addressed by the interpretive plan developed for this building and the quality and type of exhibits planned. These alternatives are described briefly in the next section.

ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

Three primary components of the rehabilitation were identified during the Value Analysis as having alternative treatment possibilities. These included the treatment of the glazing on the observation deck, reconstruction of the original center wall, and exhibit design, as described briefly below. Refer to Figure 4 for key building components discussed below.

Glazing on Observation Deck

Two treatment options for how to address the existing glazing on the observation deck (retain existing mullioned fixed glazing and removal of the glazing entirely) are included in Alternative A and Alternative as described in the next section of this Chapter. Three additional options for treatment of these windows were preliminarily identified. The first included providing glazing on the observation deck that was in some manner operable. This included mounting operable windows at the existing glazing location that could be opened and closed as the weather dictated or installing storm windows at the existing glazing location that could be reinstalled on a seasonal basis. This was eliminated from detailed analysis due to difficulty of construction, operability and increased maintenance.

A second option included removal of the existing windows and installation of a folding glazed wall at the north column line. This concept was proposed initially and evaluated by the interdisciplinary team. A folding glazed wall option was subsequently rejected due to the problems with circulation this would create with a wall at the north column line. This alternative was then modified to include an operable wall (not folding, but sliding) at the south column line. An operable wall at the south column line (Figure 5) is included in Alternative B described in the next section of this Chapter.

A third option included installation of butt jointed glazing. This preliminary alternative included the removal of the existing observation deck glazing, frames and mullions (solid vertical elements separating the existing windows) on the observation deck and replacement with butt jointed glazing. This glazing would not have had solid pillars where the pieces of glass join together. The existing space between the observation deck and the exhibit room would have remained intact. This alternative would have provided for a continuous view of the canyon, no longer interrupted by mullions, thus more closely matching the original open view provided at this building. This alternative was carried forward into later design phases where it was determined not to be structurally sound. Due to the existing roof overhang and the amount of potential snow load, the Park Historical Architect and design consultants determined that butt jointed glazing, without other structural supports, would not be able to withstand the expected fluctuation in roof deflection during heavy snowloads. While installation of other structural supports for the roof (narrow vertical steel pipes) could be installed with the butt jointed glazing and was preliminarily considered, park management determined that this would not meet the overall intent of the replacement of the existing windows in the first place, which was to restore a more unobstructed view of the canyon. For these reasons, installation of butt jointed glazing was ultimately determined not to be feasible and was dismissed from further analysis.

Center Wall
Once feasible options for the glazing on the observation deck were determined, the interdisciplinary team at the Value Analysis determined whether rebuilding the original center wall was possible. From a functional point of view, rebuilding a solid center wall would not work for interpretive purposes and NPS staff felt that constricted circulation space for visitors would result. For this reason, rebuilding the solid center wall was eliminated from further analysis.

Exhibits
An interpretive plan has been developed for this project and would focus on providing a learning experience that facilitates a connection between the visitor and the unique geologic resource of Grand Canyon. Three levels of exhibit quality and complexity were initially explored to meet the goals of this interpretive plan. The exhibit plan that received the highest overall score during the CBA process was one that included interactive exhibits with objects, panels and text. These styles of exhibits would provide a higher level of engagement, would accommodate more learning styles and sensory connections and would promote resource stewardship through enhanced opportunities for repetition, reinforcement and analogy. This exhibit plan is common to all alternatives described below. The other two preliminary exhibit plans were eliminated from further analysis because they did not provide a high level of engagement and did not accommodate different learning styles.

Some additional project components also necessitated alternative treatment comparisons during the development of this project. These included treatment of entry doors and selection of a mechanical system.

Entry Doors
The interdisciplinary team, designers, various NPS staff and SHPO discussed options for the treatment of the existing exterior doors to the east and west entrances. The original construction of these entrances was of solid wood plank construction. The south exterior door is believed to be the original door of this type of construction. In contrast, the original construction drawings show glazed French doors with sidelights. The present construction of the east and west doors was done in 1977-1978 and is not historic. Options for treatment of these doors, since they are in need of repair and are not historic, were evaluated. One option considered was to replace these solid wood doors with modern, butt-glazed doors and sidelites, to mimic the original intent of the construction drawings and to create a more open and inviting entry. This option was dismissed from further analysis due to the clear evidence that the original doors were solid wood and the desire to keep the building configured as it was originally constructed.

Mechanical Systems
Options for cooling the building included an evaluation of increasing natural ventilation through relief air fans in the ceiling and operable windows. Upon further investigation into building temperatures during the summer months and the only minimal success of the temporary air conditioning units installed in the building, a cooling system is warranted. A natural ventilation system with operable windows was eliminated as an alternative because it did not meet the cooling needs of the building.

ALTERNATIVE DESCRIPTION

Alternatives are described below. Figure 4 includes a schematic floor plan of the building, showing the layout of the building and proposed work. Table 1 summarizes the primary

components of each alternative and Table 2 summarizes the expected impacts from implementation of the alternatives.

Alternative A – No Action. This alternative would not change the existing situation. Yavapai Observation Station would remain in its current condition. The building would continue to be out of compliance with current accessibility standards and building codes. Log vigas, roofing and stone masonry would still need repair. Exterior doors and windows would not be restored or repaired. Heating and cooling systems would continue to be inadequate and energy-consumptive. The building would continue to be without a fire detection and sprinkler system. Yavapai Observation Station would continue to function primarily as a bookstore/observatory and not as an interpretive facility.

The no action alternative does not meet the purpose and need for action, but provides a basis for comparing the management direction and environmental consequences of the action alternative. If the no action alternative were selected, NPS would respond to future needs related to this building without major actions or changes in course.

Alternative B – Preferred Alternative. This alternative would fully rehabilitate both the interior and exterior of Yavapai Observation Station, in full compliance with Director's Order 28 (Cultural Resources Management Guideline) and the Secretary of the Interior's Standards for the Treatment of Historic Properties (Weeks and Grimmer 1995). Specific project components are listed below.

Alternative B meets the purpose and need for action by bringing the building up to current codes, sensitively repairing building elements and upgrading mechanical, structural, electrical and fire protection systems. Alternative B also meets the purpose and need for action by returning Yavapai Observation Station to its original function as a museum and interpretive facility through expanded exhibits and use of interior space.

Alternative B would include the implementation of necessary maintenance and rehabilitation of the building (Figure 4) including the actions listed below.

Implementation Phasing
There are two phases to the implementation of the preferred alternative for this project. Phase I includes all interior and exterior rehabilitation actions and installation of new exhibits, as described in detail below. Phase II includes the eventual removal of the observation deck windows. The implementation of Phase II would not occur right away and is contingent on several parameters being met. This is also described in detail below.

PHASE I

Exterior Rehabilitation

- Replacement of roofing and installation of new roof flashing, drains and scuppers.
- Selective repointing of stone masonry.
- Existing log vigas and beams would be reinforced in selected locations. The existing vigas on the north side of the building would be extended by approximately 12 inches to help restore the original look of the building.
- Repainting of all exterior wood elements.
- Repair of historic exterior south and southeast entrance doors (repainting, rehabilitate or replace hardware, weatherstripping).

- Removal of non-historic east and west entrance doors and replacement with a rustic plank design similar to those at the south and southeast entrance doors.
- Re-grading and repaving of asphalt paths surrounding the building to meet accessibility requirements.
- Replacement of exterior lighting with low light, night sky conforming fixtures.
- Replacement of existing signage, as needed.
- Removal of unnecessary equipment and accessories on the roof and on the sides of building, where appropriate. A possible location for some of this equipment may be the north side of the building, below or near the catwalk.
- Replacement of the fall suppression system on the north side of the building. There is an existing system in place that is used periodically by NPS personnel who clean the observation deck windows. They hook into a system to prevent falling. This system would need to be re-installed or replaced to meet occupational and safety and health (OSHA) requirements
- Connect underground utility systems (water, electrical, communication, lines to air quality transmissometer) with new supply lines for improvements in the building

Interior Rehabilitation

- Removal of cement plaster finish from parapet wall on the observation deck and rehabilitation of original stone finishes.
- Removal of existing carpet and restoration of original scored concrete flooring.
- Removal of existing sales desk, shelving and displays.
- Reconfiguration of office and storage areas to accommodate sprinkler system, electrical system and storage needs. Removal of the sink in the office area.
- Paint interior plaster and wood finishes.
- Replacement of light fixtures in their same location with modern fixtures, compatible with historic interior and conducive to exhibit design
- Removal of abandoned ducts and vents and installation of a new mechanical heating and cooling system. Removal of existing radiant heaters on the vigas. The heating/cooling system will be roof-mounted with ducts providing forced air into the interior spaces using the existing soffitts and interior walls. Exhaust fans will use existing roof penetrations.
- Removal of the airlock glazing between the entry vestibule and the observation deck.
- Installation of a fire detection and sprinkler system. Sprinkler piping will be exposed.
- Upgrading of structural system and electrical systems to meet current building codes

Two other key components of Alternative B address the need for a new exhibit design and the treatment of the observation deck, as described below:

Installation of New Exhibits

An interpretive plan has been developed and would focus on providing a learning experience that facilitates a connection between the visitor and the unique geologic resource of Grand Canyon. Exhibits would provide a multi-sensory visitor experience, utilizing graphic panels, ceiling-mounted lighting, text panels, simple and complex displays of interpretive objects, small dioramas, models and a variety of simple interactive exhibits. Exhibits would focus on the roofed terrace and the exhibition hall, functions for interpretation similar to that used in 1928. The design of the exhibits would be in keeping with the Secretary of the Interior's Standards for the Treatment of Historic Properties and would be distinctive yet compatible with the historic building.

The exhibits are being designed so that they would be functional following implementation of both Phase I of the rehabilitation effort and Phase II of the rehabilitation, as described below. Some minor relocating of exhibits may be necessary following the installation of an interior glass wall under Phase II.

Staging

The staging area will be located on the entrance path to the building, and would include at least 10 parking spaces in the parking lot. This area would be fenced if necessary. Workers would also use the dirt parking area to the west of the main entrance road for storing materials and vehicles.

Vegetation Management

Several small shrubs would be removed as part of the rehabilitation effort in order to connect a new waterline with the existing underground system and a small pinyon pine tree [less than seven inches diameter at breast height (DBH)] would be removed on the north side of the building to maintain the view of the canyon from the east vestibule. Removal of other trees and shrubs may be necessary in the future to maintain views of the canyon and to manage vegetation around the building. Vegetation removal and/or pruning necessary for the current rehabilitation effort and for any future periodic maintenance would adhere to the Park's tree pruning guidelines with the goal of retaining the health and integrity of the trees and shrubs treated while also accomplishing the intent for improving views or other aesthetic goals. This minor short- and long-term vegetation management would be conducted in consultation with appropriate Park vegetation specialists, as described in the Mitigation Measures section of this Chapter.

Implementation of Phase I would begin in mid-October 2003 and is expected to take nine to twelve months to complete.

PHASE II

Glazing on the Observation Deck

The second phase of implementation would include the complete removal of the observation deck windows, to restore the original open-air terrace, and installation of a fixed glazed wall at the south column line with an operable pair of doors (Figure 5). As stated by the Park Superintendent, implementation of this action would be contingent upon the following parameter being met:

> Visitation levels to Yavapai Observation Station drop to approximately 2,500 people daily when a mass transit system is in place, tour buses no longer have direct access, and/or the planned interpretive facility in the historic powerhouse area of Grand Canyon Village is functioning.

This phased approach is proposed due to concerns that immediate implementation of the second phase would likely result in circulation problems for visitors during current peak seasons by significantly reducing the interior space in the building. This second phase would be feasible, however, and desirable, when peak visitation levels drop significantly, which is anticipated following mass transit implementation.

It would take approximately one week to remove the mullioned windows and restore the open air terrace. Mechanical cranes would likely be necessary to hoist the glazing from the north side of the building.

Mitigation measures developed for this project (pages 22 – 26) would apply to implementation of Phase II, as appropriate. Construction staging for the short time necessary for implementation of Phase II would be as described above under Phase I. Vegetation management actions may also be

necessary during implementation of Phase II and would follow guidelines described above under Phase I and all applicable mitigation measures.

Implementation of Phase I would include actions that do not preclude implementation of Phase II, and would prepare the building for the eventual implementation of Phase II (i.e. installing a floor drain in the observation deck while the floor is being repaired, or installing a heating system for the building that could be shut off in the observation deck).

Alternative B meets the purpose and need for action by bringing the building up to current codes, sensitively repairing building elements, upgrading electrical and fire sprinkler systems, and improving heating and cooling. Alternative B also meets the purpose and need for action by returning Yavapai Observation Station to its original function as a museum and interpretive facility through expanded exhibits and use of interior space.

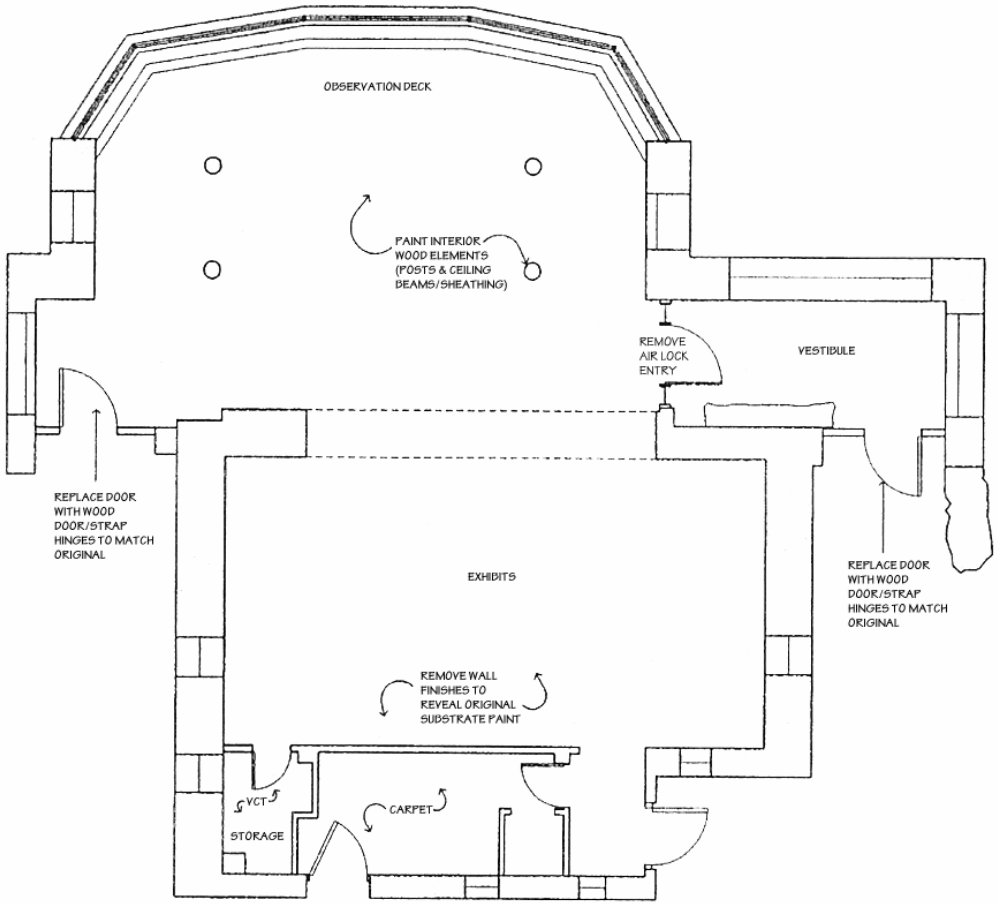
IDENTIFICATION OF THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which guides the Council on Environmental Quality (CEQ). The CEQ provides direction that "[t]he environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101:

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
5. achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Using selection factors from the Choosing by Advantages process and through the process of internal scoping, scoping with the public and other agencies, the environmentally preferred alternative selected is Alternative B. Alternative B best meets the purpose and need for action and best addresses the overall Park Service objectives and evaluation factors.

Alternative A (No Action) would not address inadequacies of the existing building and would not contribute to the preservation of existing historic structures. Therefore, Alternative A would not fulfill criterion 2 and 4. Alternative B would fulfill criterion 2 and 4 by addressing current inadequacies of the building and rehabilitating a National Historic Landmark-eligible building. No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Alternative B is recommended as the preferred alternative and meets both the purpose and need for action and project objectives.



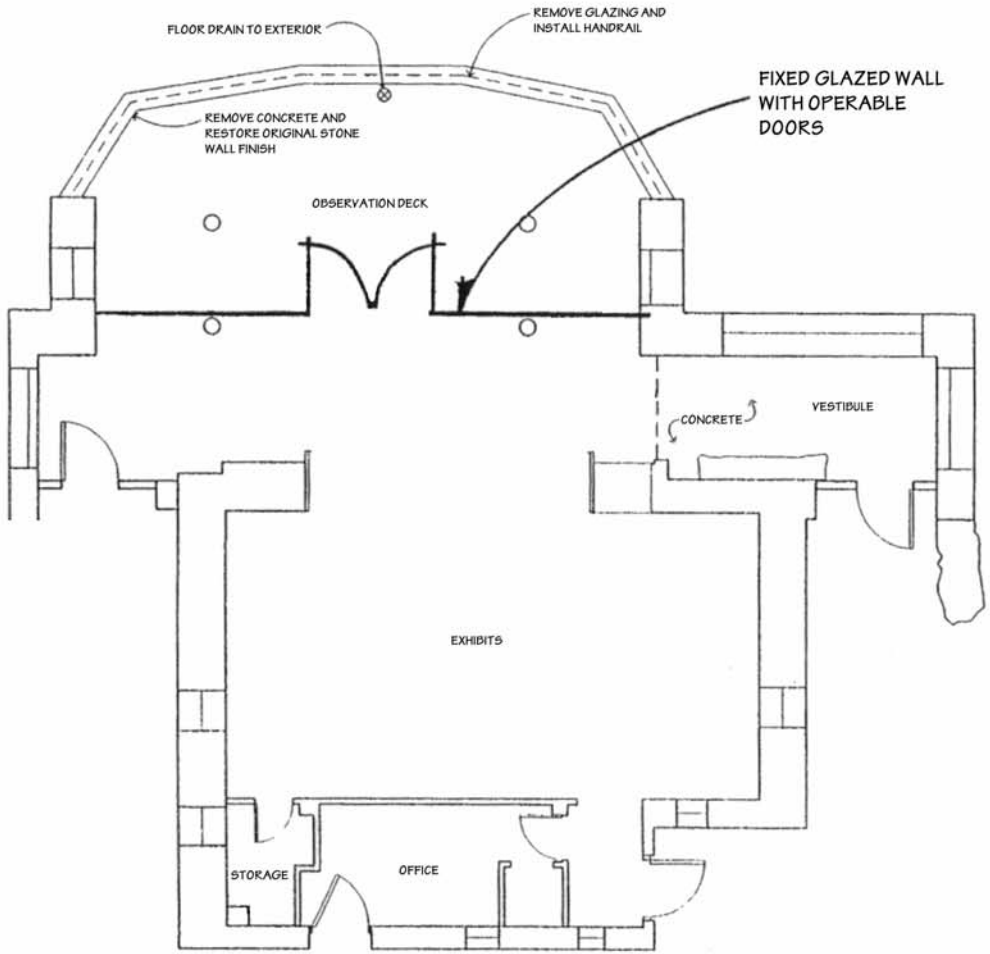
PROJECT COMPONENTS FOR PHASE I INCLUDING SUCH THINGS AS:
(refer to page 17-20 for full list of proposed actions)

EXTERIOR REHABILITATION
BRACE STONE PARAPETS
REPLACE BUILT-UP ROOFING
NEW ROOF FLASHING, DRAINS AND SCUPPERS
CLEAN BIOLOGICAL GROWTH FROM EXTERIOR STONE MASONRY
SELECTIVE REPOINTING OF STONE MASONRY
REPAIR/REPLACE LOG VIGAS (DUTCHMAN AND EPOXY)
-TREAT WITH BORATIC PRESERVATIVES
REPAIR ALL WINDOW TO OPERABLE CONDITION, REPAINT
REPAINT ALL DOORS, INSTALL NEW WEATHERSTRIPPING AND THRESHOLDS
NEW ASPHALT PAVING FOR ADA ACCESS/PATH OF TRAVEL

INTERIOR REHABILITATION
PROVIDE EXPOSED, 4" DRY PIPE SPRINKLER SYSTEM
PROVIDE AUTOMATIC FIRE DETECTION SYSTEM
REPLACE (E) 120/208v SINGLE PHASE ELECTRICAL SERVICE
NEW ELECTRICAL PANELBOARD
NEW LIGHT FIXTURES THROUGHOUT
REMOVE GLAZING BETWEEN VESTIBULE AND OBSERVATION DECK

STRUCTURAL SCOPE
REPLACE MISSING STONES
REPLACE MISSING WOOD MEMBERS
GROUT GAPS AT PARAPET

Figure 4: Alterative B, Phase I, Yavapai Observation Station. Exterior and interior rehabilitation.



PROJECT COMPONENTS FOR PHASE II WILL INCLUDE:

RECONSTRUCT PORTION OF STONE PARTITION WALL BETWEEN OBSERVATION DECK & EXHIBITS

REMOVE GLAZING AT OBSERVATION DECK & INSTALL GUARDRAIL

REMOVE CONCRETE FINISH FROM NORTH WALL (AT OVERLOOK) AND RESTORE ORIGINAL STONE FINISHES AT INTERIOR

INSTALL FIXED GLAZED WALL WITH OPERABLE DOORS AT SOUTH COLUMN LINE

Figure 5: Alternative B, Phase II, Yavapai Observation Station. Removal of observation deck windows and installation of fixed glazed wall at south column line.

MITIGATION MEASURES

To minimize resource impacts, the integral design features (i.e. mitigation measures) below would be followed during implementation of either of the action alternatives, and are analyzed as part of the action alternatives. These actions were developed to lessen the potential for adverse effects of the proposed action, in combination with foreseeable future actions, and have proven to be very effective in reducing environmental impacts on previous projects.

Contractor Orientation. Contractors working in the Park are given orientation concerning proper conduct of operations. This orientation is provided in both written form and verbally at a preconstruction meeting. This policy will continue on proposed projects. Orientation topics will include:

- Wildlife should not be approached or fed.
- Collecting any Park resources, including plants, animals, and historic or prehistoric materials, is prohibited.
- Contractor must have a safety policy in place and follow it.
- A vehicle fuel leakage and spill plan will be developed and implemented for this project.
- Other environmental concerns and requirements discussed elsewhere in this EA would be addressed, including relevant mitigation measures listed below.

Limitation of Area Affected. The following mitigation measures will be implemented to minimize the area affected by construction activities.

- The staging area for the construction office (a trailer), construction equipment, and material storage will be located in previously disturbed areas near the project site. All staging areas will be returned to pre-construction conditions once construction is complete. Standards for this, and methods for determining when the standards are met, will be developed in consultation with the Park Restoration Biologist.
- Construction zones will be fenced with construction tape, green snow fencing, or some similar material before any construction activity. The fencing will define the construction zone and confine activity to the minimum area required for construction. All protection measures will be clearly stated in the construction specifications, and workers will be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.

Soil Erosion. To minimize soil erosion, the following mitigation measures will be incorporated into the action alternative.

- Standard erosion control measures such as silt fences, sand bags, or equivalent control methods will be used to minimize any potential soil erosion.

Vegetation Management. To minimize impacts to vegetation, the following mitigation measures will be incorporated into the action alternative.

- Vegetation removal and/or pruning necessary for this project and for any future periodic maintenance adjacent to the building will adhere to the Park's tree pruning guidelines with the goal of retaining the health and integrity of the trees and shrubs treated, while also accomplishing the intent to improve views or achieve other aesthetic goals.

- Vegetation removal or pruning would be conducted in consultation with appropriate Park vegetation specialists to ensure impacts are minimized.

Exotic Vegetation and Noxious Weeds. To prevent the introduction and minimize the spread of exotic vegetation and noxious weeds, the following mitigation measures will be incorporated into the action alternatives.

- Existing populations of exotic vegetation at the construction site will be treated prior to construction activities.
- All construction equipment that would leave the road (e.g., bulldozers and backhoes) will be pressure washed prior to entering the Park.
- The location of the staging area for construction equipment will be Park-approved and treated for exotic vegetation.
- Parking of vehicles will be limited to existing roads or the staging area.
- Any fill, rock, or additional topsoil needed will be obtained from a Park-approved source.
- All areas disturbed by construction will be revegetated using site-adapted native seed and/or plants.

Water Quality. To minimize potential impacts to water quality, the following mitigation measures will be incorporated into the action alternatives.

- Standard erosion control measures such as silt fences, sand bags, or equivalent control methods will be used to minimize any potential sediment delivery to streams.

Special Status Species. To protect any unknown or undiscovered threatened, endangered, or special status species, the construction contract will include provisions for the discovery of such. These provisions will require the cessation of construction activities until Park staff evaluates the project impact on the discovery and will allow modification of the contract for any protection measures determined necessary to protect the discovery. Mitigation measures for known special status species are as follows:

California Condor

- Prior to the start of a construction project, the Park will contact personnel monitoring California condor locations and movement within the Park to determine the locations and status of condors in or near the project area.
- If a condor occurs at the construction site, construction will cease until it leaves on its own or until permitted personnel employ techniques that result in the individual condor leaving the area.
- Construction workers and supervisors will be instructed to avoid interaction with condors and to contact the appropriate Park or Peregrine Fund personnel immediately if and when condor(s) occur at a construction site.
- The construction site will be cleaned up at the end of each day that work is being conducted (i.e., trash disposed of, scrap materials picked up) to minimize the likelihood of condors visiting the site. Park condor staff will complete a site visit to the area to ensure adequate clean-up measures are taken.
- To prevent water contamination and potential poisoning of condors, a vehicle fluid-leakage and spill plan will be developed and implemented for this project. This plan will be reviewed by the Park biologist for adequacy in addressing condors.

- If a new structure occurs on the rim or above tree line in other areas, there may be a need to install condor deterrent devices on the structure. This will be evaluated on a case-by-case basis by the Park wildlife biologist.
- If non-nesting condors occur within 1 mile of the project area, blasting will be postponed until condors leave or are hazed by permitted personnel.
- If condor nesting activity is known within 1 mile of the project area, then blasting activity will be restricted during the active nesting season, if viable nests persist. The active nesting season is February 1 to October 15, or until young are fully fledged. These dates may be modified based on the most current information, in consultation with the Park biologist and the USFWS.
- Prior to the implementation of Phase II of this project (removal of the observation deck windows), the Park Biologist would be consulted to determine if any additional mitigation measures for condors would be necessary. These might include affixing nixalite as a deterrent to roosting or perching on or near the observation deck and stationing a seasonal wildlife technician in the building for condor hazing, as needed.
- If condor nesting activity is known within 0.5 mile of the project area, then light and heavy construction in the project area will be restricted during the active nesting season, if viable nests persist. The active nesting season is February 1 to October 15, or until young are fully fledged. These dates may be modified based on the most current information, in consultation with the Park biologist and the USFWS.

Cultural Resources. To minimize the impacts of construction activities on cultural resources, the following mitigation measures will be incorporated into the action alternatives.

- If previously unknown archeological resources are discovered during the course of the project, a park archeologist will be contacted immediately. All work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed, if necessary, in accordance with the stipulations of the 1995 Programmatic Agreement among the National Park Service, the Arizona State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding the General Management Plan/Environmental Impact Statement, Grand Canyon National Park, Arizona.
- All workers would be informed of the penalties of illegally collecting artifacts or intentionally damaging any archeological or historic property. Workers would also be informed of the correct procedures if previously unknown resources were uncovered during construction activities.
- All undertakings affecting historic buildings and structures will be carried out in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (60 FR 35842-35844) and other applicable NPS cultural resources policies and guidelines.

Visitor Experience. The following mitigation measures will be incorporated into the action alternatives to minimize the impacts of construction activities on the visitor experience:

- Yavapai Observation Station will be closed to visitors during the construction period.
- Traffic in any one direction will not be stopped for more than 15 minutes to minimize disruption to traffic flow.

- Unless otherwise approved by the Park, operation of heavy construction equipment will be restricted to 8:00 am to 6:00 pm in the summer (May 1- September 30) and to 9:00 am to 5:00 pm during the rest of the year.
- Information regarding implementation of this project and other foreseeable future projects would be shared with the public upon their entry into the park during construction periods. This may take the form of an informational brochure or flyer about the projects distributed at the gate and sent to those with reservations at park facilities, postings on the park's website, press releases, and/or other methods. The purpose of these efforts would be to minimize the potential for negative impacts to the visitor experience on the South Rim during implementation of this project and other planned projects during the same construction season.
- Commercial operators will not be allowed to use the Yavapai Observation Station parking area or to drop off visitors during the construction period.

Air Quality. Air quality impacts of the action alternatives are expected to be temporary and localized. To minimize these impacts, the following actions will be taken:

- To reduce entrainment of fine particles from hauling material, sufficient freeboard will be maintained and loose material loads (aggregate, soils, etc.) will be tarped.
- To reduce tailpipe emissions, construction equipment will not be left idling any longer than is necessary for safety and mechanical reasons.
- To reduce construction dust in the short term, water will be applied to problem areas. Equipment will be limited to the fenced project area to minimize soil disturbance and consequent dust generation.
- Landscaping and revegetation will control long-term soil dust production. Mulch and the plants themselves will stabilize the soil and reduce wind speed/shear against the ground surface.

Alternatives and Project Objectives: The objectives of the action are described in Chapter 1 and summarized here: 1) Implement direction outlined in the 1995 GMP for Yavapai Observation Station to function as a museum/interpretive facility, focusing on geology, physiography and related themes; 2) Comply with the most recent accessibility guidelines when rehabilitating the building; 3) Comply with the most recent building codes, fire codes and life safety standards when rehabilitating the building; 4) Preserve the historic features and character-defining spaces and elements, while improving the functionality and safety of the building for current uses. Modifications to the building will be done in a manner that will minimize negative physical and visual effects to the cultural resource, and 5) Minimize new ground disturbance surrounding the building.

The preferred alternative clearly addresses each of these objectives by addressing accessibility requirements, building codes, safety standards, and minimizing ground disturbance, while designing all necessary modifications to restore and/or retain historic fabric and character-defining features. Table 1 displays alternative components and compares the ability of the alternatives to meet project objectives.

Table 2. Summary of Alternative Components

Component	Alternative A – No Action	Alternative B – Preferred Alternative
Key Exterior Rehabilitation Components	No action taken	• Roof repair and replacement • Selective repair/replacement of log vigas and repointing of masonry • Replacement of east and west entry doors with rustic plank design • Removal of unnecessary equipment on roof •
Key Interior Rehabilitation	No action taken	• Removal of carpet and restoration of original scored concrete floor • Removal of sales desk, shelving and displays • Install fire detection and protection system • Rehabilitate windows • Replacement of light fixtures • Reconfiguration of office and storage areas • Structural system upgrade
HVAC	No action taken	• Roof-mounted heating/cooling system with ducts providing forced air into interior spaces
Site work	No ground disturbance	• Re-grading and paving of asphalt paths surrounding the building, estimated at less than 0.25 acres • Minor vegetation removal and pruning
Accomplishment of Project Objectives	Does not accomplish project objectives	• Achieves all project objectives

Table 3. Comparative Summary of Environmental Impacts.

Impact Topic	Alternative A – No Action	Alternative B – Preferred Alternative
Historic Resources	Eligible National Historic Landmark building would continue to need repair; deteriorated log vigas and stone masonry would remain; deteriorated interior finishes and inefficient mechanical systems would remain; observation deck would continue to be enclosed with mullioned glazing; Yavapai Observation Station would continue to function primarily as a bookstore and not as an interpretive facility.	Direct impacts would occur but actions would not result in an adverse effect to the historic property. Consultation with SHPO is on-going. Rehabilitation and maintenance in accordance with Director's Order 28 and the Secretary's Standards would result in beneficial effects to historic resources.
Special Status Species	No change	Condors may be attracted to construction site but mitigation measures are in place to adequately address this potential. Eventual removal of observation deck glazing may result in condor attraction to building. For purposes of Section 7 consultation, this project may affect, but is not likely to adversely affect the California condor and would have no impact to peregrine falcons.
Visitor Experience	Yavapai Observation Station would continue to be a destination point for many park visitors, including school groups and tour groups. Views of the canyon from within the building would continue to be limited by mullioned glazing on observation deck. Opportunities for learning about the geology of the canyon limited to existing exhibitry and existing interpretive programs. Facility would continue to be a prime outlet for Grand Canyon Association booksales.	Short-term moderate adverse impacts to visitor experience during construction period, when the building would be closed. These short-term impacts would be outweighed by the long-term moderate beneficial impacts as a result of rehabilitation of this prominent National Historic Landmark, greatly enhanced interpretive opportunities, and improvements in view from eventual removal of glazing.
Park Operations	No change; long-term minor adverse impacts would continue due to continued deterioration of the building and increased maintenance needs	Minor short-term adverse impacts during construction period. Moderate beneficial long-term impacts to park operations with building improvements and enhanced interpretive program. Negligible to minor adverse long-term impacts due to eventual removal of observation deck glazing and the potential for increased maintenance during the winter months.

Chapter 3 – Affected Environment and Environmental Consequences

INTRODUCTION

This Chapter describes the present condition (i.e. affected environment) within the project area and the changes (i.e. environmental consequences) that can be expected from implementing the action alternatives or taking no action at this time. The no action alternative sets the environmental baseline for comparing the effects of the other alternatives. The impact topics (see Chapter 1) define the scope of the environmental concern for this project. The environmental effects, or changes from the present baseline condition, described in this chapter reflect the identified relevant impact topics, and include the intensity and duration of the action, mitigation measures and cumulative effects.

The National Environmental Policy Act (NEPA) requires that environmental documents disclose the environmental impacts of proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented.

Grand Canyon National Park encompasses approximately 1.2 million acres in northern Arizona. The project is located on the South Rim in Grand Canyon Village, approximately 6 miles north of Tusayan, Arizona. Grand Canyon Village serves as the south entrance to the park and is the first park development south entrance visitors encounter. Grand Canyon Village is a destination point for many Grand Canyon visitors and provides many services such as lodging, restaurants, post office, bank, gift shops, entertainment and orientation.

Methodology

The impact analysis and conclusions contained in this chapter were based on park staff knowledge of the resources and site; review of existing literature and park studies; information provided by specialists within the National Park Service and other agencies; and professional judgement. Detailed information on natural and cultural resources in Grand Canyon National Park that is summarized in the 1995 GMP and associated Environmental Impact Statement (EIS) was specifically referenced for information on affected resources in the project area.

Potential impacts in this chapter are described in terms of type (are the effects beneficial or adverse?), context (are the effects site-specific, local or even regional?), duration (are the effects short-term or long-term?), and intensity (negligible, minor, moderate or major). Because definitions of intensity can vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this EA.

For purposes of impact analysis in this Chapter, the following definitions of duration are used to characterize impacts discussed.

- Short-term – temporary effects, typically confined to the construction period.

- Long-term – more permanent effects that will remain following construction.

CUMULATIVE IMPACTS

Cumulative impact is defined as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions, taking place over a period of time (40 CFR 1508.7). Therefore, it is necessary to identify other ongoing or foreseeable future actions within the vicinity of the project area.

For this analysis, foreseeable future actions were considered to be actions that could occur in or near Grand Canyon Village within the next 5 years which currently have funding or for which funding is being sought. Five years was selected as the period for foreseeable future actions because many of the actions identified in the GMP are likely to either be planned or implemented by that time. The area of impact was chosen to be the Grand Canyon Village vicinity due to the potential for impacts of multiple actions on park operations, visitor experience, and cultural resources in this highly-used area. Because implementation of this project is expected to result in minimal impact to the natural environment, a watershed analysis was not used for this project.

Foreseeable future actions that could occur in or near Grand Canyon Village include 17 projects and are listed and discussed briefly in Appendix C. Several of the proposed future projects were identified in the GMP to address future increases in visitation and the need to minimize the impacts of increased visitor use on natural and cultural resources. These include projects such as a new interpretive facility, mass transit, campground rehabilitation, walkway rehabilitaton, trail development and restroom rehabilitation. Cumulative impacts are addressed by resource in this chapter.

IMPAIRMENT OF PARK RESOURCES OR VALUES

In addition to determining the environmental consequences of implementing the alternatives, National Park Service policy (*Management Policies 2001*) requires analysis of potential effects to determine whether actions would impair park resources.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. The potential for impairment is discussed for each resource for each alternative in this chapter and a statement summarizing the conclusions of this evaluation is included in the conclusion statement at the end of the environmental consequences section for each resource in this chapter.

CULTURAL RESOURCES

HISTORIC

Affected Environment

Yavapai Observation Station, eligible as a National Historic Landmark: Yavapai Observation Station (also known as the Yavapai Point Museum) was built in 1928 expressly for observing and understanding the geology of Grand Canyon. It is an example of the Park's pursuit of a singular and aesthetically appropriate architecture for the park system. This building exemplifies the National Park Service philosophy of melding the built environment into the natural landscape. The building is also an excellent illustration of characteristics of Pueblo architecture. The prominent architect Herbert C. Maier designed the building, inspired by the ideology of Mary Colter. The building was among the earliest interpretive structures in the park system (ARG 2001).

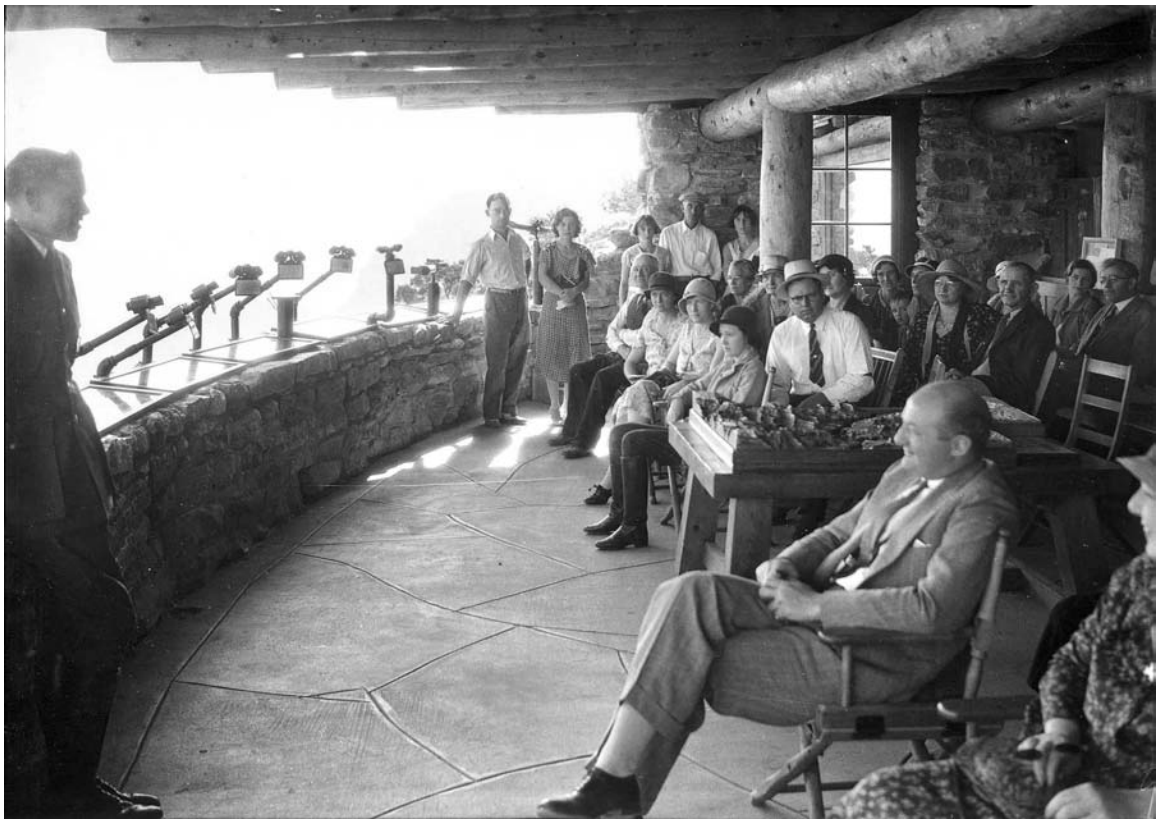
Dramatically poised on the perimeter of the South Rim, the building's sighting on the canyon ledge is integral to its design and expression (Figure 2). Flat-roofed and built low to the ground with battered stone walls, the one-story structure was designed to be particularly unobtrusive in its setting (Figure 5). The original design's defining feature and function was the way in which the structure, form the interior, framed an expansive and specific panorama between the parapet wall below and the exaggerated overhang above to maximize wide vistas and create an unparalleled viewing experience (Figure 6). Yavapai Observation Station was nominated to the National Register of Historic Places in 1990 (Appendix D). Due to its significance in relation to its role in the development of interpretive structures within the park system, it is considered eligible for designation as a National Historic Landmark.

Yavapai Observation Station was the first formal interpretive structure at Grand Canyon. It represents the establishment of trailside museums and a careful design of their interpretive content through a coordinated effort of scholars, scientists, curators and researchers (ARG 2001). The interior was initially laid out as two distinct spaces with different purposes, characteristics, and light-reflecting qualities: the open-air viewing terrace and the exhibit room for focused, close-up study. The exhibit room was accessed by a door in the rock wall partitioning the spaces and could be closed when unstaffed. The terrace was never closed or locked and functioned more like a porch or deck, freely accessible to visitors at all hours. The building was equipped with a large model of the Grand Canyon, samples of rock, charts, maps and telescopes.

The Historic Structure Report (HSR), prepared by Architectural Resources Group in 2001, provides detailed information on the building, including character-defining features, alterations, current condition, and recommendations for rehabilitation. A summary of the information contained in the nomination to the National Register is included in Appendix D. The information

Figure 6. Yavapai Observation Station, shortly after construction, showing low roofing and rough stone construction (GRCA archives).

Figure 7. Yavapai Observation Station, in its early use, showing open observation deck (GRCA archives)



provided in the HSR forms the basis for the rehabilitation efforts identified in the preferred alternative. This EA incorporates by reference the detailed information contained in the HSR.

Site and Description: Yavapai Observation Station sits somewhat isolated from Grand Canyon Village, on a prominent point (Yavapai Point) to the east, the area's best vantage point. It is accessed off of the South Rim Entrance Road (Figure 1).

The boundary of the history property encompasses a perimeter 25 feet around the building. It also includes a corridor along the rim to the west and to the east. The location of the building has remained unchanged since construction and the surrounding natural environment is largely as it was at the time of construction. No other structures impinge on the building.

When the building was completed in 1928, there was no restroom facility. A comfort station was added as an outbuilding at the time of the original construction. This was removed in 1959 and replaced with the current restroom facility near the parking area. An extensive life-zone garden of native wild plants was initiated in the grounds surrounding the Yavapai Point Museum following initial construction. The rest of the area of landscaped with plants native to the South Rim. These plantings served an educational purpose and the gardens and paths became an integral part of the building's design and expression.

Yavapai Observation Station's first change came soon after construction. In 1930, the parapet's straight roofline was altered to achieve a more serrated and naturalistic style. In 1953, alterations were made to address persistent problems. The open terrace allowed the elements in and caused problems with heating and cooling and snow removal, restricting its use during the winter months. Seating space on the observation deck for lectures was also limited. For these reasons, windows were sealed, the interior rock wall was removed and the floor plan was changed to increase seating space. The roof overhang was reduced and the glazing was installed on the observation deck. The alteration of the open terrace on the observation deck resulted in the building's most significant change and wholly transformed the visitor experience. In 1978, the observation deck windows were replaced with tinted glass. Other renovations in 1978 included reconstruction of interior wall, replacement of entrance doors, carpeting, construction of a steel frame window and doorway to separate foyer from terrace and removal of auditorium seating. A new roof was installed in 1983. Design and installation of a fullsize bookstore occurred in 1992-1993.

Current Condition: Yavapai Observation Station is not in a dilapidated state, but the building has acquired certain features over time that detract from its richness, as described in Chapter 1, page 1. Overall, the exterior of the building retains a high level of integrity. The most significant change to the exterior is the loss of the life-zone gardens. The installation of tinted single-pane windows, heavy window frames and the removal of part of the roof overhang negatively impacted the building functionally and aesthetically.

The interior has been altered from its original condition and interior finishes are largely replacements. Window openings have been altered and in-filled. The condition of original materials is difficult to ascertain since much of it is covered by carpet, shelving, etc. The tar and gravel roof is in fair condition, although flashing, drains and scuppers need replacement. Some loss of mortar on the exterior of the building has occurred and log ends have deteriorated. Paving stones are worn and exterior wood benches are in fair to poor condition (ARG 2001)

Environmental Consequences

Methodology

The baseline information used to assess impacts to historic resources is as described in the methodology section at the beginning of this chapter and includes park staff knowledge of the resources and site; review of existing literature and park studies; information provided by specialists within the National Park Service and other agencies; and professional judgement. Detailed information on natural and cultural resources in Grand Canyon National Park that is summarized in the 1995 GMP and associated Environmental Impact Statement (EIS) was specifically referenced for information on affected resources in the project area. Additional sources of information on cultural resources used as a basis for this evaluation are as described above in the affected environment section.

In order for a structure or building to be listed in the National Register of Historic Places, it must be associated with an important historic context, i.e. possess significance – the meaning or value ascribed to the structure or building, *and* have integrity of those features necessary to convey its significance, i.e. location, design, setting, workmanship, materials, feeling, and association (see National Register Bulletin #15, *How to Apply the National Register Criteria for Evaluation*). For purposes of analyzing potential impacts to historic structures/buildings, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impact(s) is at the lowest levels of detection - barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: **Adverse impact** - impact would not affect the character defining features of a National Register of Historic Places eligible or listed structure or building.
Beneficial impact - stabilization/ preservation of character defining features in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, to maintain existing integrity of a structure or building.
For purposes of Section 106, the determination of effect would be *no adverse effect*.

Moderate: **Adverse impact** - impact would alter a character defining feature(s) of the structure or building but would not diminish the integrity of the resource to the extent that its National Register eligibility is jeopardized.
Beneficial impact – rehabilitation of a structure or building in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, to make possible a compatible use of the property while preserving its character defining features. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Major: **Adverse impact** - impact would alter a character defining feature(s) of the structure or building, diminishing the integrity of the resource to the extent that it is no longer eligible to be listed in the National Register. For purposes of Section 106, the determination of effect would be *adverse effect*.
Beneficial impact – restoration in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, to accurately depict the form, features, and character of a structure or building as it appeared during its period

of significance. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Alternative A – No Action.

Direct/Indirect Impacts: The No Action alternative would likely result in long-term indirect minor to moderate adverse impacts over time as the building is allowed to deteriorate further without rehabilitation or maintenance. Continued lack of maintenance could result in adverse impacts to the historic Yavapai Observation Station over time, resulting in a loss of historical and structural integrity. This potential loss of integrity is not likely to jeopardize the building's National Register eligibility, however. The last major rehabilitation effort occurred in 1978, over 25 years ago. The building would continue to be at risk from fire due to the lack of a fire sprinkler system and would not be compliant with building code and current accessibility standards. Mechanical systems would continue to be inefficient and many interior finishes would continue to be inappropriate for the historic character of the building.

Cumulative Impacts: The historical integrity of some buildings and structures within Historic Districts in the park is threatened by structural deterioration. Allowing Yavapai Observation Station to deteriorate by implementing the no action alternative could threaten its historical integrity. Other foreseeable projects (Heritage Education Campus, Greenway trail implementation, etc.) also have the potential to impact historic buildings scheduled for adaptive reuse, or to visually alter the South Rim's historic setting as a result of new construction. The NPS would avoid or mitigate potential adverse impacts by ensuring new construction adheres to appropriate design guidelines, that preservation maintenance and/or more comprehensive rehabilitation is carried out in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (Weeks 1995), and that the Arizona State Historic Preservation Office is consulted as necessary.

Not moving forward with rehabilitation efforts at this time is expected to impact the structural and historical integrity of the building. Combining this lack of action at this time, with past alterations to the building (see cumulative impact discussion under Alternative B below) would likely contribute to a loss of historical integrity, although this is not likely to jeopardize the building's National Register eligibility in the foreseeable future. Consequently, minor to moderate long-term impacts to historic resources would be expected from taking no action at this time to rehabilitate this building.

Impairment: Direct, indirect and cumulative impacts to historic resources would be minor to moderate as a result of implementing the no action alternative. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of Grand Canyon National Park's historic resources or park values.

Alternative B – Preferred Alternative

The rehabilitation efforts outlined under this alternative would be conducted according to the Secretary of the Interior's Standards for the Treatment of Historic Properties (Weeks 1995). The information presented in the HSR has been used as the basis for determining appropriate components of the rehabilitation effort. The State Historic Preservation Officer has been, and will continue to be, consulted with on the implementation of this project, to ensure that actions do not result in an adverse effect to the historic building or its historic setting.

Direct/Indirect Impacts: Rehabilitation of Yavapai Observation Station in accordance with the Secretary's Standards and the recommendations made in the HSR is expected to result in a direct moderate beneficial long-term impact to the building by restoring historic finishes, repairing historic structural components, and installing a fire protection system. Creating a more functional space to accommodate current and future use as an interpretive facility is in keeping with the Secretary's Standards for rehabilitation. Bringing the building up to current accessibility, safety and building codes is also expected to result in improvement in the functionality and safety of the building, allowing for continued use by park staff. The intent of the interior rehabilitation is to install historically compatible finishes wherever possible. All of the proposed rehabilitation efforts are designed to preserve the historic features and elements of the building and maintain character-defining features, while improving the functionality and safety of the building for current users.

When Phase II is implemented, the restoration of the open observation deck would further benefit the historic character of the building by restoring, at least in part, its original function as an open-air trailside museum. The installation of the glass wall at the south column line (Figure 5), a contemporary addition to the building to serve its current users, is in keeping with the Secretary of the Interior's Standards and would be a distinctive, yet compatible modern addition to the building.

Cumulative Impacts: The historical integrity of some buildings and structures within Historic Districts in the park is threatened by structural deterioration. Likewise, the construction of modern, non-contributing buildings has compromised the districts' architectural integrity to a minor degree. Other foreseeable projects (Heritage Education Campus, Greenway trail implementation, etc.) also have the potential to impact historic buildings scheduled for adaptive reuse, or to visually alter the district's historic setting as a result of new construction. The NPS would avoid or mitigate potential adverse impacts by ensuring new construction adheres to appropriate design guidelines, that preservation maintenance and/or more comprehensive rehabilitation is carried out in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (Weeks and Kay 1995), and that the Arizona State Historic Preservation Office is consulted as necessary.

Modifications to Yavapai Observation Station have occurred over the years, resulting in changes in physical appearance, condition and use. These past modifications combined with planned future actions for the building should be reviewed for the cumulative impact on this National Historic Landmark eligible property. A chronology of development and building alteration was compiled for the preparation of the HSR (ARG 2001). Some of the key past alterations include installation of tinted windows on the observation deck, carpeting and installation of a full-size bookstore. Even though these and other changes have altered the interior and exterior of the building, it still retains a high degree of integrity (ARG 2001). Rehabilitation efforts under this proposal will impact the building, but these impacts are expected to be minor to moderate, since project components have been designed to maintain the integrity of the building by preserving its historic features and elements and maintaining character-defining features. A separate Assessment of Actions having an effect on cultural resources form (AEF) is being prepared for this project (NPS 2003) and includes a detailed analysis of the expected impacts of this project on cultural resources.

New construction on the South Rim and on the periphery of historic districts has the potential to visually intrude on the integrity of the district's historic setting. Negligible to minor cumulative impacts on the historic character of the districts on the South Rim would be expected, provided new facilities are sensitively designed. A cultural landscape inventory is currently being

conducted in Grand Canyon Village. This inventory should result in a comprehensive report that includes all significant cultural resources in the area. Using this report in all current and future planning efforts for this area is expected to minimize the potential for adverse impacts to historic resources in Grand Canyon Village and the South Rim. Therefore, the Yavapai Observation Station rehabilitation project is not expected to adversely affect historic properties. The implementation of the preferred alternative for this project, combined with past, present and reasonably foreseeable future actions is expected to have negligible to minor cumulative impacts on historic buildings and districts because future projects have the potential to impact historic properties. Other future construction projects within or adjacent to Historic Districts, and rehabilitation efforts on existing historic structures, would be developed in consultation with SHPO, NPS architects and cultural resource staff to ensure the facilities are in keeping with the Secretary's Standards, and do not intrude on the district nor diminish the district's character-defining qualities. New facilities would be designed to be distinctive but compatible with the affected district. In other words, facilities would have their own unique design that is appropriate and fitting for their location within or adjacent to Historic Districts. Consequently, negligible to minor long-term adverse impacts to historic resources would be expected.

Impairment: Direct, indirect and cumulative impacts to historic resources would be both beneficial and adverse, and would range from negligible to moderate. Beneficial impacts from repair and rehabilitation efforts in accordance with the Secretary's Standards would outweigh the potential for adverse impacts. Therefore, implementing Alternative B would not result in impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of Grand Canyon National Park's historic resources or park values.

Conclusions: If the no action alternative were selected, impacts to historic resources are expected to be minor to moderate and adverse, due to the continued deterioration of the historic fabric of the building. If the action alternative were selected, impacts are expected to be negligible to moderate and both beneficial and adverse. Beneficial impacts are expected to outweigh the potential for adverse impacts due to the extensiveness of the rehabilitation effort in keeping with the Secretary's Standards which would restore much of the historic fabric in the building, retain existing character-defining features, and provide for a safe and code-compliant building for continued use. Minor beneficial impacts are also expected under the implementation of the action alternative due to the fact that Yavapai Observation Station is a significant structure and this alternative provides for continued use and preservation of a National Historic Landmark-eligible building. It has been determined that the implementation of either of the alternatives would not result in impairment of historic resources.

After applying the Advisory Council on Historic Preservation's criteria for adverse effects (36 CFR, Part 800.5, Assessment of Adverse Effects), the National Park Service determines that implementation of the preferred alternative would result in a "no adverse effect to historic properties" determination.

Status of SHPO Consultation: Consultation between the National Park Service (NPS) and the State Historic Preservation Officer (SHPO) on this project is on-going. SHPO was a key team member during the Value Analysis in June 2001. SHPO concurred with the park's preliminary determination that implementation of this project, as described in the preferred alternative, would result in a no adverse effect determination to historic resources on 12 December 2001. Additional discussions regarding this project occurred on 16 – 17 October 2002, 18 December 2002, 20 February 2003 and 22 May 2003. Full documentation of the assessment of actions having an

affect on cultural resources, or the Assessment of Effects form (AEF) is being prepared separately for this project (NPS 2003), to facilitate continued consultation with the SHPO.

NATURAL RESOURCES

SPECIAL STATUS SPECIES

Table 4 includes a list of threatened, endangered, proposed, and species of concern known to occur in the project vicinity, or species whose habitat may be present in project area. In-depth discussion of federally listed species issues in the analysis area is the subject of a separate Biological Assessment (BA), the results of which are summarized in this EA. Of the nine federally listed wildlife and plant species that are known to occur or are likely to occur in Grand Canyon National Park, four (Bald eagle, Mexican spotted owl, Sentry milk vetch and California condor) occur on or near the South Rim. Bald eagles are known to roost in the park in the winter and there is a confirmed winter roost on the South Rim. However, the project site is greater than two miles from this roost. Sentry milk vetch occurs in a few locations on the South Rim, but all known sites are associated with either the East or West Rim drives and are several miles from the project site. There is no potential habitat for either of these species in the project area. For these reasons, bald eagle and sentry milk vetch were dismissed from further detailed analysis.

Mexican Spotted Owls (MSO) are known to occur in Grand Canyon National Park and some breeding areas have been confirmed below the canyon rim on the South Rim. The nearest known MSO Protected Activity Center (PAC) to the project area is approximately 0.75 miles to the east, below the rim. All suitable habitat in the vicinity of the project area has been surveyed and no additional MSO have been found. The most recent conservation measures for this species, as developed for the batch consultation with the Fish and Wildlife Service for multiple construction projects in the park (June 2002) were reviewed for applicability to this project. While the Yavapai Observation Station rehabilitation project was included in this batch consultation, the boundaries of the nearest PAC have been modified since that time, based on more recent locality information from MSO field crews (T. Bowden, Grand Canyon National Park, pers. comm. 5/03). This refinement of the PAC boundary resulted in the Yavapai observation station project area falling out of the area of concern, 0.5 miles from the PAC boundary. Blasting would not be necessary for this project. For these reasons, construction activities associated with the project would not result in disturbance to this PAC, and MSO was dismissed from further analysis.

There is a confirmed American peregrine falcon (a special status species) eyrie within approximately 0.25 miles of the building and condors have been observed frequently in the project area.

The list in Table 4 was developed from personal knowledge of the area by park biologists, park records, the AGFD Heritage Nongame Data Management System database (2000), and Arizona Game and Fish Department and U.S. Fish and Wildlife Service biologists.

Table 4. Special Status Species pertinent to the proposed Yavapai Observation Station rehabilitation project, based on known occurrences or habitat preferences.

Common Name	Species	Status	Project Vicinity Occurrence
California Condor	*Gymnogyps californicus*	T*, WC	Yes; condors observed frequently in project area, but no confirmed nest sites nearby. Nearest confirmed nest is in the inner canyon, over 5 miles from project area.
Peregrine Falcon	*Falco peregrinus anatum*	Delisted	Yes; Confirmed territory centered at Yavapai Point. Nest site is within approximately 0.25 miles of project area.

Key: *T = federally listed as threatened under the Endangered Species Act (ESA); WC = Wildlife species of special concern in Arizona (AZ Game and Fish Department 1996); SC = former species of concern to the US Fish and Wildlife Service, but for which there is no legal status (all former C2 species Federal Register (1996a); T* = federally listed as an experimental non-essential population in Arizona, but in National Parks the species is considered federally listed as threatened under ESA.*

Peregrine falcon is included on the list above, even though it is no longer a federally listed species. A monitoring program is being developed by the U. S. Fish and Wildlife Service to guide monitoring activities following delisting. An initial goal of monitoring at least 25 peregrine territories in the Colorado Plateau and adjacent low desert regions is part of this nation-wide effort. Grand Canyon National Park has not been contacted to date on participation in this monitoring effort. Due to the size and extent of the population within the park, participation in the monitoring program is likely, however. During this monitoring effort, the park will continue to consider peregrine falcons a species with special status.

Affected Environment

CALIFORNIA CONDOR

California condors ((*Gymnogyps californianus*) are large birds that reach sexual maturity by 5-6 years of age. They are strict scavengers and rely on finding their food visually, often by investigating the activity of ravens, coyotes, eagles, and other scavengers. Without the guidance of their parents, young inexperienced juveniles may also investigate human activity. As young condors learn and mature this human-directed curiosity diminishes.

The California condor was listed as an endangered species in March 1967. In 1996, the USFWS established a nonessential, experimental population of California condors in northern Arizona. In December 1996 the first condors were released in the Vermillion Cliffs area of Coconino County, Arizona, approximately 48 km (30 miles) north of Grand Canyon National Park. Subsequent releases have occurred in May 1997, November 1997, November 1998, December 1999, February 2002 and December 2002 in the same vicinity and in the Hurricane Cliff area, which is about 96 km (60 miles) west of Vermillion Cliffs. By declaring the population "nonessential, experimental", the USFWS can treat this population as "threatened" and develop regulations for management of the population that are less restrictive than mandatory prohibitions covering endangered species. This facilitates efforts to return the condor to the wild by providing increased opportunities to minimize conflict between the management of the condors and other activities. Within Grand Canyon National Park, the condor has the full protection of a threatened species (NPS 1991).

Nesting habitat for California condors includes various types of rock formations such as crevices, overhung ledges, and potholes. Most California condor foraging occurs in open meadows and throughout the forested areas of the rims and slopes of the inner canyon. Typical foraging behavior includes long-distance reconnaissance flights, lengthy circling flights over a carcass, and hours of waiting at a roost or on the ground near a carcass. Roost sites include cliffs and tall trees, including snags (61 FR 54043-54060).

As of December 2002, the population of free-flying condors in Arizona totaled 33. All of the California condors in northern Arizona are fitted with radio transmitters that allow field biologists to monitor the condors' movements. Condors have been observed as far west as the Virgin Mountains near Mesquite, Nevada; south to the San Francisco Peaks outside of Flagstaff, Arizona; north to Zion and Bryce Canyon National Parks and beyond to Minersville, Utah; and east to Mesa Verde, Colorado and the Four Corners region (Peregrine Fund 2000). Monitoring data indicate condors are using habitat throughout Grand Canyon National Park, with concentration areas in Marble Canyon, Desert View to the Village on the South Rim, and the Village to Hermits Rest. During the summer/fall of 2002, the North Kaibab National Forest was used frequently for perching, roosting and foraging. Potential nesting habitat exists throughout the Park. One nesting attempt was documented in the Marble Canyon area in 2001. Two nest sites on the South Rim, one on The Battleship and one on Dana Butte, were initiated in 2002. Both nest sites failed. It is unclear whether condors would select nesting areas in close proximity to developed portions of the Park. Nesting activities have been documented this year, with confirmed nests in two areas, and suspected nests in two additional sites (E. Leslie, Grand Canyon National Park, pers. comm. 3/19/03). All of these nesting areas are greater than 1 mile from the project area.

The main reason for the decline of condors was an unsustainable mortality rate of free-flying birds combined with a naturally low reproductive rate. Most deaths in recent years have been related to human activity. Shootings, poisonings, lead poisoning, and powerline collisions are considered the condor's major threats.

PEREGRINE FALCON

The American peregrine falcon (*Falco peregrinus anatum*) was listed as endangered in 1970. On 25 August 1999, the USFWS removed the peregrine falcon from the federal list of endangered and threatened wildlife due to its recovery. Peregrine falcons generally nest on cliffs near water. However, river cutbanks, trees, and manmade structures have been used as nesting habitat (USFWS 2000). Peregrine falcons feed primarily on other birds such as songbirds, shorebirds, and waterfowl. The usual method of obtaining prey is by attacking flying birds from above or chasing them from behind. Peregrines may travel up to 17 miles from nesting cliffs to hunting areas. Preferred foraging habitats include cropland, meadows, river bottoms, marshes, and lakes. Prey species may include, but are not limited to, blackbirds, jays, doves, shorebirds, and smaller songbirds.

The population of peregrine falcons in Arizona is steadily increasing. In 1991, the peregrine falcon population in the Rocky Mountain/Southwest region was 367 known pairs; in 1998, the number of pairs had increased to 535. In Arizona, the known number of peregrine falcon pairs was 159 in 1999 (64 FR 46542-46558). Extensive surveys have been conducted over the years in Grand Canyon National Park by park biologists and U.S. Geological Survey/BRD personnel. The Grand Canyon provides excellent cliff nesting habitat for peregrines and numerous eyries have been documented within the park. In a Draft Addendum to the Recovery Plan, the Fish and Wildlife Service recommended delisting of the southwestern regional population because the recovery goals outlined in the 1984 Plan have been met. As part of the delisting criteria, a five

year monitoring plan would be established. FWS is currently in the process of establishing the monitoring areas for this plan and the eyries within the park are likely for inclusion. Multiple peregrine eyries are known along the South Rim. The nearest known eyrie to Yavapai Observation Station is within 0.25 miles of the project area, associated with Yavapai Point.

The principal cause of the peregrine's decline was chlorinated pesticides, especially DDT and its metabolite DDE, which accumulated in peregrines as a result of feeding on contaminated prey. This interfered with calcium metabolism and caused a decline in reproductive success as the result of thin eggshells. Other limiting factors included availability of cliffs and prey that can limit distribution or numbers of breeding falcons, competition for nesting cliffs with other raptors, and possible predation to eggs and young.

Environmental Consequences

Methodology

The baseline information used to assess impacts to condors and peregrine falcons is as described in the methodology section at the beginning of this chapter and includes park staff knowledge of the resources and site; review of existing literature and park studies; information provided by specialists within the National Park Service and other agencies; and professional judgement. Detailed information on natural and cultural resources in Grand Canyon National Park that is summarized in the 1995 GMP and associated Environmental Impact Statement (EIS) was specifically referenced for information on affected resources in the project area. Additional sources of information on wildlife used as a basis for this evaluation are as described above in the affected environment section.

The thresholds of change for the intensity of an impact to special status species are defined as follows:

Negligible: an action that could result in a change to a population or individuals of a species, or designated critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence. For purposes of Section 7 consultation for federally listed species, the change would likely result in a *no effect* determination.

Minor: an action that could result in a change to a population or individuals of a species or designated critical habitat. The change could be measurable but small and localized and of little consequence. For purposes of Section 7 consultation for federally listed species, the change would likely result in either a *no effect* determination or a *may affect, not likely to adversely affect* determination, dependent on the species and its relation to the project area.

Moderate: an action that would result in some change to a population or individuals of a species or designated critical habitat. The change would be measurable and of consequence. For purposes of Section 7 consultation for federally listed species, the change would likely result in either a *may affect, not likely to adversely affect* determination or a *likely to adversely affect* determination, depending on the species and its relation to the project area. Consultation with the U.S. Fish and Wildlife Service would occur to confirm the appropriate determination.

Major: an action that would result in a noticeable change to a population or individuals of a species or resource or designated critical habitat. For purposes of Section 7

consultation for federally listed species, the change would likely result in a *likely to adversely affect* determination. Consultation with the U.S. Fish and Wildlife Service would occur to confirm the appropriate determination.

CALIFORNIA CONDOR

Alternative A – No Action

Direct/Indirect: Existing developments at the South Rim create year-round human presence in the vicinity. Human presence creates the possibility for condor/human interactions. Condors are monitored daily via radio telemetry, and any condors that land in the developed area at the South Rim would be hazed by permitted Park employees to ensure condors do not become habituated to humans. Current Park policies and activities would be continued under Alternative A, and adverse impacts to condors would be negligible, long-term, and local. No vegetation manipulation or construction activities are proposed under Alternative A. No California condor habitat would be impacted, and no new sources of disturbance would be introduced with this alternative. Therefore, the No-Action Alternative would have no additional effects on California condors.

Cumulative Impacts: Ongoing activities at the South Rim create year-round disturbance in the vicinity and provide the potential for condor/human interactions. Foreseeable future developments at the South Rim would be primarily limited to existing developed areas and would not increase the long-term likelihood of condor/human interactions. Construction activities associated with the action alternatives and any future developments may attract condors. Mitigation measures, such as those included in this document, would reduce the potential for detrimental interactions between condors and humans for any of the alternatives as well as any foreseeable future actions. The cumulative effects of taking no action at this time, in combination with other past, present, and reasonably foreseeable future actions, on condors would be minor, short- and long-term, local, and adverse.

Impairment: Direct, indirect and cumulative impacts to condors would be negligible as a result of implementing the no action alternative. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of Grand Canyon National Park's resources or park values.

Alternative B – Preferred

Direct/Indirect Effects. Alternative B would not result in any impacts to nesting or roosting habitat for the California condor because all such habitat occurs below the rim. No vegetation manipulation would occur below the rim, and no activities related to increasing visitor use of the area below the rim are proposed. Foraging habitat would not be affected because these alternatives would not change the availability of food sources for condors.

The action alternative could affect California condors through increased contact with humans during construction. Condors may be attracted by construction activities, and condor contact with humans would be of concern if the birds are harassed or become habituated to humans. Mitigation measures to cease construction activities if condors are present would reduce disturbance from construction activities on the birds. Hazing by permitted Park employees would ensure condors do not become habituated to humans. Because all activities proposed under the action alternative would occur in areas of the South Rim that are already developed, use of the

Yavapai Observation Station should not have any long-term effects on the potential for interactions between condors and humans.

However, due to innate curiosity by condors, they are frequently attracted to areas of high human density, particularly along the South Rim from March through October. For this reason, it is likely they would be attracted to the observation deck following eventual implementation of Phase II. Removal of windows may increase the likelihood of condors frequenting this area which may result in condors entering the observation deck or the interior of the building. A condor was documented entering the building through an open window in Yavapai Observation Station in 1999. Prior to the implementation of Phase II, the Park Biologist would be consulted to determine if any additional mitigation measures for condors would be necessary. These might include affixing nixalite as a deterrent to roosting or perching on or near the observation deck and stationing a seasonal wildlife technician in the building for condor hazing, as needed (Chapter 2, page 25).

Cumulative Impacts: Ongoing activities at the South Rim create year-round disturbance in the vicinity and provide the potential for condor/human interactions. Foreseeable future developments at the South Rim would be primarily limited to existing developed areas and would not increase the long-term likelihood of condor/human interactions. Construction activities associated with the action alternatives and any future developments may attract condors. Mitigation measures, such as those included in this document, would reduce the potential for detrimental interactions between condors and humans for any of the alternatives as well as any foreseeable future actions. The cumulative effects of the preferred alternative, in combination with other past, present, and reasonably foreseeable future actions, on condors would be minor, short- and long-term, local, and adverse.

Impairment: Direct, indirect and cumulative impacts to condors would be minor as a result of implementing the preferred alternative. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of Grand Canyon National Park's resources or park values.

Section 7 Consultation
A detailed analysis of the expected effects of this project on Threatened and Endangered species is the subject of a separate Biological Assessment (NPS 2002). The potential for adverse impacts to federally listed species from implementation of the rehabilitation, as identified in the preferred alternative, has been consulted on with the U.S. Fish and Wildlife Service (USFWS). USFWS concurred with the park's determination that implementation of this project, along with many other construction projects in the park over the next five years, may affect, but is not likely to adversely affect, the California condor or their habitat. Peregrine falcons were also discussed in this document (USFWS letter July 9, 2002).

Conclusion
The No-Action Alternative would have no effects on California condors. Alternative B would not result in modification of habitat for condors, but would result in increased noise disturbance during construction and an increased potential for condors to be attracted to the project area during construction. Adverse impacts from this potential would be minimized by implementation of mitigation measures. There may be an increased likelihood of condor attraction to the building following implementation of Phase II when the observation deck windows are removed. This

would be minimized by the implementation of mitigation measures. Alternative B would result in a may affect, not likely to adversely affect determination for California condor. Consultation with USFWS on this determination has been completed.

PEREGRINE FALCON

Alternative A – No Action

Direct/Indirect: The construction of existing developments on the South Rim has likely affected potential habitat for peregrine prey. This local, adverse, long-term impact is negligible because the amount of habitat affected is negligible compared the amount of available habitat. Noise from year-round activities at the South Rim likely affects peregrines to some extent because several eyries are known near developed areas of the South Rim, including one at Yavapai Point. The level of this impact is not known, but considered negligible to minor due to the confirmed nesting success of many of these territories and the expansion of the peregrine population throughout its range. Therefore, while impacts of the continuation of current Park policies on peregrine falcons would be adverse, they would be negligible, local, and long-term. No construction would take place under Alternative A, and this alternative would have no additional effects on peregrine falcons.

Cumulative Impacts: Past development of the South Rim has likely affected potential peregrine foraging habitat and additional foraging habitat could be affected by foreseeable future developments. None of the foreseeable future developments would affect nesting habitat below the rim or increase use of the area below the rim. The majority of the developments would occur in existing disturbed areas and would not measurably change prey base populations. Cumulative adverse impacts of taking no action at this time, in combination with past, present, and reasonably foreseeable future actions, would therefore be negligible, local, and long-term.

Impairment: Direct, indirect and cumulative impacts to peregrines would be negligible as a result of implementing the no action alternative. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of Grand Canyon National Park's resources or park values.

Alternative B – Preferred

Direct/Indirect Effects. Alternative B would not result in any impacts to nesting or roosting habitat for peregrines because all such habitat occurs below the rim. No vegetation manipulation would occur below the rim, and no activities related to increasing visitor use of the area below the rim are proposed. Foraging habitat would not be affected because vegetation would not be disturbed and the limited amount of ground disturbance proposed would be in existing disturbed areas. This would not change the availability of food sources for peregrines. Peregrine falcons could be affected by noise disturbance associated with construction activities at Yavapai Observation Station due to the fact that there is an eyrie within 0.25 miles of the project area. The potential for this increased noise disturbance would be minimized by the fact that the majority of the work would be conducted outside the breeding season for peregrines. Those actions that may continue into the spring months of 2004 would consist of minor site work and exterior and interior rehabilitation completion, and would not likely result in noise generation greater than ambient conditions, considering the high level of use this area gets from visitors in the spring and

summer months. Therefore, Alternative B would have a minor, local, long-term, adverse impacts to peregrine falcons.

Cumulative Impacts: Past development of the South Rim has likely affected potential peregrine foraging habitat and additional foraging habitat could be affected by foreseeable future developments. None of the foreseeable future developments would affect nesting habitat below the rim or increase use of the area below the rim. The majority of the developments would occur in existing disturbed areas and would not measurably change prey base populations. Cumulative adverse impacts of the preferred alternative, in combination with past, present, and reasonably foreseeable future actions, would therefore be negligible, local, and long-term.

Impairment: Direct, indirect and cumulative impacts to peregrines would be minor as a result of implementing the preferred alternative. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of Grand Canyon National Park's resources or park values.

Section 7 Consultation
Peregrine falcons are no longer a federally listed species. However, peregrines were discussed in a detailed analysis of the expected effects of this project on Threatened and Endangered species in a separate Biological Assessment (NPS 2002). The potential for adverse impacts to federally listed species and to peregrine falcons from implementation of this project, as identified in the preferred alternative, has been consulted on with the U.S. Fish and Wildlife Service (USFWS). USFWS concurred with the park's determination that implementation of this project, along with many other construction projects in the park over the next five years, may affect, but is not likely to adversely affect the California condor or their habitat. Peregrine falcons were included in the analysis (USFWS letter July 9, 2002).

Conclusion
The No-Action Alternative would have no effects on peregrine falcons. Impacts of Alternative B on peregrine falcons would be minor, adverse, local, and short-term. Adverse cumulative impacts would also be negligible, local, and long-term. Alternative B may affect individual peregrine falcons but is not likely to result in a trend toward federal listing or a loss of population viability.

VISITOR EXPERIENCE

Affected Environment

Grand Canyon National Park receives over four million visitors per year, the majority of which visit Grand Canyon Village on the South Rim during their stay. Yavapai Observation Station is currently used as a bookstore and an observatory for viewing the canyon. Yavapai Observation Station is one of the few buildings on the rim where people can get exceptional views of the canyon and be protected during harsh weather. For many visitors the observation station is also an opportunity to use restrooms and get water. From Grand Canyon Village, visitors can drive, ride the shuttle bus or walk the rim trail to the observation station. Yavapai Observation Station has an information desk, a Grand Canyon Association sales area and an observation area. There are currently no opportunities for visitors to learn, on their own, about the geology of the Grand Canyon. There is an NPS presence in the building during peak season, either through interpretive

geology programs hosted by an NPS ranger at the building or through occasional staffing of the information desk. Visitors currently must contact a ranger, attend an interpretive program or purchase a book in order to find this information.

The building is often extremely crowded. Summer visitation can run as high as 6,000 people per day (GMP 1995). Many commercial bus tours stop at Yavapai Observation Station and commercial bus tour guides give talks in front of the windows. This adds to already crowded conditions in the building during peak season.

Outside the observation station, visitors can walk to Yavapai Overlook, take the Greenway Trail to Mather Point, or the rim trail to Grand Canyon Village.

Environmental Consequences

Methodology

The baseline information used to assess impacts to visitor experience is as described in the methodology section at the beginning of this chapter and includes park staff knowledge of the resources and site; review of existing literature and park studies; information provided by specialists within the National Park Service and other agencies; and professional judgement. Detailed information on visitor use in Grand Canyon National Park that is summarized in the 1995 GMP and associated Environmental Impact Statement (EIS) was specifically referenced for information on affected resources in the project area. Additional sources of information on visitor experience used as a basis for this evaluation are as described above in the affected environment section.

The thresholds of change for the intensity of an impact are defined as follows:

Negligible: the impact is barely detectable, and/or will affect few visitors.

Minor: the impact is slight but detectable, and/or will affect some visitors.

Moderate: the impact is readily apparent and/or will affect many visitors.

Major: the impact is severely adverse or exceptionally beneficial and/or will affect the majority of visitors.

Alternative A - No Action

Direct/Indirect Impacts: Long-term indirect adverse impacts may occur to the building over time as the building is allowed to deteriorate further without rehabilitation or maintenance. Continued lack of maintenance could result in adverse impacts to the historic Yavapai Observation Station over time, resulting in a loss of historical and structural integrity. This loss would be noticeable to visitors over time. Visitors would continue to come to Yavapai Observation Station and consider it a destination point. The building would continue to serve as a primary observatory of the canyon and a place that offers retail sales and some limited interpretive programs and exhibits. Implementation of the No Action alternative would not implement direction outlined in the GMP to restore the building's original function as a geologic museum and interpretive facility and visitors who seek geological information about the Grand Canyon would not be receiving it. This would result in a long-term minor to moderate adverse impact to visitor experience on the South Rim. While Canyon View Information Plaza (CVIP) is complete and serves the orientation role for visitors entering the park, there is currently no functioning visitor center per se. If Yavapai Observation Station rehabilitation were not implemented at this time, this need for

visitor interpretation would continue to go unaddressed until plans for an interpretive facility in the historic powerhouse area (Heritage Education Campus, see Appendix C) materialize.

Cumulative Impacts: Taking no action at this time, in combination with the implementation of past, present and reasonably foreseeable future actions (Appendix C) would result in impacts to visitor experience in the Park. Many of the proposed actions outlined in Appendix C are designed to benefit visitors in the Park and these proposed projects implement actions identified in the 1995 GMP. Visitors would benefit from implementation of these other actions, even if Yavapai Observation Station remained in its current state and continued to functioning as it does presently. However, rehabilitating the observation station and returning it to its original function as a geologic museum and interpretive facility is a key action item identified in the GMP. If this were not implemented at this time, the Park would continue to lack key interpretive and educational facilities until the proposed interpretive facility in the historic powerhouse area is implemented. Implementing the preferred alternative at Yavapai Observation Station would provide the only opportunity in the Park for visitors to view the canyon and be able to learn about it at the same time. Therefore, cumulative impacts to visitor experience from implementing the No Action alternative would be adverse, minor and long-term. The potential for adverse impacts to visitors from taking no action at this time are lessened by the implementation of foreseeable future actions that are designed to benefit the visitor experience in the park.

Alternative B – Preferred Alternative

Direct/Indirect Impacts: Many of the actions identified in the rehabilitation effort for this building are expected to result in moderate long-term beneficial impacts to visitors. Following implementation of Phase I, most of the rehabilitation would be complete, benefiting visitors in the observation station. Exhibits would greatly improve the interpretive function of this building and provide visitors with a state-of-the-art geologic museum. Even though book sales would be reduced in the building, visitors would still have access to interpretive information through the items that would still be on sale in the limited book store area. Visitors would also continue to have access to a large bookstore at CVIP and in other areas of the Park. Offering an interpretive facility here fills a critical need in the park to provide this type of information to visitors since the closure of the Visitor Center following construction of CVIP. While CVIP offers orientation and much information regarding the park and how best to explore it, it was not designed to serve an interpretive role. Implementation of the preferred alternative would provide visitors with an opportunity to learn more about the geology of the canyon. Using Yavapai Observation Station as an interpretive facility once again would provide this resource for visitors, while the proposed larger key interpretive facility in the historic powerhouse area of Grand Canyon Village (Heritage Education Campus, see Appendix C) is being planned.

If the criteria for implementation of Phase II are met (Chapter 2, page 18), visitors would also benefit from the removal of the windows on the observation deck and its restoration to an open-air terrace. This would again provide visitors with the unique experience of standing on the deck which, from the interior, "frames an expansive and specific panorama between the parapet wall below and exaggerated overhang above to create an unparalleled viewing experience and to maximize wide vistas" (ARG 2001), like earlier visitors to the park when Yavapai Observation Station was first constructed. Visitors would benefit from restoration of this open-air, but framed, viewing experience from the deck, while also being able to access the interior of the observation station through the door in the glazed wall. Even during inclement weather, the canyon could easily be viewed through the glass wall on the south column line, offering a less-dramatic, but full view of the canyon, while sheltered from the elements.

Rehabilitation of Yavapai Observation Station in accordance with the Secretary's Standards and the recommendations made in the HSR is expected to result in a direct beneficial long-term impact to the building by restoring historic finishes, repairing historic structural components, and installing a fire protection system. The intent of the interior rehabilitation is to install historically compatible finishes wherever possible. All of the proposed rehabilitation efforts are designed to preserve the historic features and elements of the building and maintain character-defining features, while improving the functionality as a museum and observatory for visitors. This is expected to result in a moderate long-term beneficial impact to visitor experience by improving the historic appearance and function of this important building for visitor enjoyment.

Short-term minor to moderate adverse impacts to visitor experience would occur during project implementation while the building is closed during construction. Personal vehicles would still be allowed to park in the parking lot and a path would continue to be maintained to the overlooks, the Greenway Trail and the rim trail from the parking area. Construction would not begin until mid-October, minimizing impacts to visitors during the peak summer season. Commercial tour buses would, however, not be allowed to park at the observation station during construction to minimize interaction between large groups of visitors and construction activity in this area. Tour buses would be provided with alternative locations in the park, including Canyon View Information Plaza. However, Yavapai Observation Station is a desired tour bus stop in the Park and its closure during the construction period would result in adverse impacts to these operators, but these would be minor and short-term. There would also be higher than average noise levels in this area during rehabilitation. These short-term negative impacts would be outweighed by the long-term benefits of building rehabilitation.

Based on this discussion, implementation of Alternative B would result in moderate beneficial long-term impacts to visitor experience. Short-term minor adverse impacts would occur during the construction period, but these would be outweighed by the long-term benefits of rehabilitation.

Cumulative Impacts: Implementing Alternative B, in combination with past, present and reasonably foreseeable future actions (Appendix C) would result in beneficial impacts to visitor experience in the Park. Many of the proposed actions outlined in Appendix C are designed to benefit visitors in the Park and these proposed projects implement actions identified in the 1995 GMP. Visitors would benefit from implementation of these other actions, in combination with rehabilitation of Yavapai Observation Station. Rehabilitating the observation station and returning it to its original function as a geologic museum and interpretive facility is a key action item identified in the GMP. Cumulative impacts to visitor experience from implementing the preferred alternative in combination with past and future actions would be beneficial, moderate and long-term. Short-term minor to moderate adverse impacts to visitor experience would also be expected during the construction period for this and future projects, many of which may occur during the same construction season. This may include increased noise levels, increased presence of construction equipment and personnel and road delays in some areas. These adverse impacts would be minimized by implementation of mitigation measures, such as increased information – sharing with visitors regarding projects planned or underway, and implementation of daily construction activity curfews (Chapter 2, page 25).

Conclusions: Implementing Alternative A would generally keep visitor experience within the park as it is currently. Minor to moderate long-term adverse impacts could occur if the building is allowed to deteriorate and if the building does not provide an interpretive function. Implementation of Alternative B would result in a moderate beneficial impact to visitor experience by enhancing the historic character of the building, substantially increasing interpretive opportunities at the building and returning it to a museum and interpretive facility. Short-term minor to moderate adverse impacts to visitor experience may occur during project

implementation while the building is undergoing rehabilitation. Cumulative impacts to visitor experience are expected to be beneficial when added to other past and future actions on the South Rim that are aimed at improving visitor facilities in the park, such as Canyon View Information Plaza and the proposed Heritage Education Campus.

PARK OPERATIONS

Affected Environment

Yavapai Observation Station is primarily used by Grand Canyon Association Employees but NPS staff is also stationed here during peak seasons to conduct interpretive programs and answer questions. A number of key building treatments are necessary to accommodate the use of this building more effectively and safely, including mechanical, electrical, and telecommunications upgrades, accessibility compliance, fire protection, building code upgrades, and interior and exterior rehabilitation of finishes and materials. The building lacks adequate HVAC systems, resulting in the inability to maintain interior temperatures at comfortable levels. The building currently provides space for approximately three to four employees during peak season.

Environmental Consequences

Methodology

Impacts to park operations focus on (1) employee and visitor health and safety, (2) ability to protect and preserve resources, (3) staff size, whether staffing needs to be increased or decreased, (4) existing and needed facilities, (5) communication (e.g., telephones, radio, computers, etc.), and (6) appropriate utilities (sewer, electric, water). Park staff knowledge was used to evaluate the impacts of each alternative and is based on the current description of park operations presented in the Affected Environment section of this document. Definitions for levels of impacts to park operations efficiency are as follows:

Negligible: an action that could change the operations of the park, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: an action that could change the operations of the park but the change would be slight and localized with few measurable consequences.

Moderate: an action that would result in readily apparent changes to park operations with measurable consequences.

Major: a severely adverse or exceptionally beneficial change in park operations.

Alternative A - No Action

Direct/Indirect Impacts: Implementing Alternative A would not address the current and future needs of the NPS and Grand Canyon Association employees who work in Yavapai Observation Station. Employees would continue to work in a building that is not up to current building, safety and accessibility codes/requirements. This would generally keep current park operations functioning as they do currently, but on a somewhat ephemeral basis as the building eventually becomes uninhabitable due to forestalled maintenance. Employees would continue to be at risk due to the lack of adequate fire protection (sprinkler) systems and other mechanical systems. This

is expected to result in a long-term minor adverse impact to park operations due to the inefficient use of space and the inadequacy of current mechanical, electrical, telecommunications, and fire protection systems.

Cumulative Impacts: Substantial cumulative impacts are not expected from implementation of the no action alternative when combined with past and future projects. Although park operations would not be improved in this building if the no action alternative were selected, other current and future projects such as the headquarters rehabilitation and the Backcountry Information Center project (Appendix C) would likely result in improvements in overall park operations. Slight adverse impacts to park operations from keeping the Yavapai Observation Station in its current condition are expected for this project, but they are minor and would not be measurable when compared to the other changes that would take place in Grand Canyon Village over the next 5 years as significant components of the General Management Plan are implemented. These components are fully addressed in the EIS prepared for the GMP and a cumulative impact assessment was conducted at that time, evaluating park operations as they relate to housing, community services, management support facilities, and utilities. This EA incorporates by reference the cumulative impact analysis included in the 1995 Draft and Final EIS for the General Management Plan.

Alternative B – Preferred Alternative

Direct Impacts: The preferred alternative proposes rehabilitation or installation of new systems to bring the building up to current safety, accessibility, and building codes, and some remodeling of existing space within the building. Redistribution of space would result in beneficial changes in the work environment for the employees. Improvements in accessibility would benefit physically challenged employees and visitors. Upgrades to mechanical systems would result in a more pleasant and safe work environment within the building. Additional park staff would not be needed in the building following rehabilitation. The exhibits are being designed to be self-guided. It is likely, however, that interpreters would use components of the new exhibits during geology programs held at Yavapai Observation Station.

When Phase II is implemented and the windows on the observation deck are removed, there are likely to be increased maintenance needs on the deck, particularly during the winter during snowfall. Shoveling snow and otherwise making this area safe for visitors would require maintenance crews periodically. However, the windows currently require washing and minor maintenance periodically. If the windows were removed, maintenance would no longer be needed for this function. Therefore, while building maintenance would continue to be necessary following rehabilitation it would not be substantially increased over current levels.

Rehabilitation of existing buildings instead of construction of new buildings within the park is a goal identified in the 1995 GMP when addressing current and future needs. Since the action alternative includes rehabilitation of an existing building to continue to meet administrative needs of park staff and visitor needs, the project meets the intent of the GMP.

Cumulative Impacts: Because of the limited scope of this project as it relates to park operations in Grand Canyon Village, cumulative impacts are not expected from implementation of the action alternative when combined with past and future projects. Slight beneficial improvements in park operations are expected for this project, but they are minor and would not be measurable when compared to the substantial changes that would take place in Grand Canyon Village and other areas of the South Rim over the next 5 years as significant components of the General Management Plan are implemented. These components are fully addressed in the EIS prepared for the GMP and a cumulative impact assessment was conducted at that time, evaluating park operations as they relate to housing, community services, management support facilities, and

utilities. This EA incorporates by reference the cumulative impact analysis included in the 1995 Draft and Final EIS for the General Management Plan.

Conclusions: Implementing Alternative A would generally keep all current park operations functioning as they do currently. Implementation of Alternative B would result in a minor beneficial impact to park operations by creating more efficient and useable space within the building and creating a more pleasant work environment by bringing the building up to current codes. Short-term minor adverse impacts to park operations may occur during project implementation when the building is closed. Short-term cumulative impacts to park operations would occur as a result of multiple construction projects taking place on the South Rim during the same construction season. Long-term cumulative impacts to park operations would be minor and beneficial, but limited due to the localized nature of this project when compared to other future actions in Grand Canyon Village, as identified in the GMP.

Chapter 4 – List of Preparers

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Chapter 5 – Consultation with Others

Arizona Game and Fish Department
NPS staff met with personnel from AGFD on 13 December 2000 to discuss this project proposal and other future proposals. A list of species of concern for the South Rim was discussed at this meeting.

U.S. Fish and Wildlife Service
NPS staff met with personnel from USFWS on 13 December 2000 to discuss this project proposal and other future proposals. A list of species of concern for the South Rim was discussed at this meeting. Detailed discussions between NPS staff and USFWS personnel also occurred during the preparation of the batch consultation for construction projects in the park during March – June 2002. This project and many other construction projects in the park were discussed. The Fish and Wildlife Service concurred with the park's determination that implementation of the Yavapai Observation Station rehabilitation, as one of 61 construction projects occurring over the next five years, may affect, but is not likely to adversely affect the Mexican spotted owl or the California condor. Concurrence was received on July 9, 2002.

State Historic Preservation Office
NPS staff discussed this project with the Arizona SHPO during the Value Analysis in June 2001. SHPO concurred with the Park's preliminary determination that implementation of this project would result in a no adverse effect determination to historic resources on 12 December 2001. Additional discussions and communication regarding this project occurred on 16-17 October 2002, 18 December 2002, 20 February 2003 and 22 May 2003. Consultation with SHPO is on-going.

Native American Consultation
Consultations with those tribes interested in projects occurring on the South Rim were conducted during the scoping period for this project in October 2001. A scoping letter describing the project and soliciting issues or concerns was sent to eight tribal groups. Although nine tribal groups have interests in the Park, only eight ask to be consulted on projects outside of the river corridor. Letters were received from three of these tribes (Hopi, Navajo and Zuni). The Navajo Nation and Zuni Heritage and Preservation Office had no concerns with the project as described. The Hopi Tribe requested information on prehistoric cultural resources in the area, if they may be affected by implementation of the project. The eight tribes contacted during the scoping period will also receive a hardcopy of the EA during the public comment period.

Public Involvement
The NPS sent a public scoping letter describing this project proposal to a mailing list of approximately 300 people on 24 October 2001. This letter was also posted on the park's website and a press release was issued on 25 October 2001. In addition to those comments received from tribal groups, as described above, one other comment was received from a private individual and expressed support for the project.

EA Distribution

The following groups received a hard copy of the EA for a 30 day public review and comment period. A press release, informing the public about the release of the EA for public review was also issued and the document was posted on the Park's website.

Arizona Game and Fish Department – Phoenix Office
Arizona Game and Fish Department – Flagstaff Office
Sedona Public Library
Washington County Library (St. George, Utah)
Fredonia Public Library
Flagstaff Public Library
Grand Canyon Community Library
Phoenix Public Library
Williams Public Library
Northern Arizona University Cline Library
Kanab City Library
U. S. Fish and Wildlife Service – Phoenix Office
U.S. Fish and Wildlife Service – Flagstaff Office
State Historic Preservation Office
Paiute Indian Tribe of Utah
Navajo Nation
Pueblo of Zuni
Kaibab Band of Paiute Indians
Havasupai Tribe
Hualapai Tribe
Hopi Tribe
San Juan Southern Paiute Tribe
Grand Canyon Association

SELECTED REFERENCES

Executive Orders

Executive Order 11988 (Floodplain Management)

Executive Order 12898 (Environmental Justice)

Executive Order 13186 (Migratory Birds)

NPS Director's Orders

DO-2 Planning Process Guidelines

DO-12 Conservation Planning, Environmental Impact Analysis and Decision Making

DO-28 Cultural Resource Management

DO-47 Sound Preservation and Noise Management

DO-65 Explosives Use and Blasting Safety

NPS-77 Natural Resources Management Guideline

DO-77-1 Wetland Protection

DO-13 Environmental Leadership (DRAFT)

US Federal Government and State Government

36 CFR 800.11

40 CFR, Part 503

1864 Act of Congress (13 Stat. 325)

1890 Act of Congress (26 Stat. 650)

1906 Joint Resolution of Congress (34 Stat. 831)

1955 Federal Air Quality Law

1963 Clean Air Act, as amended

1964 Wilderness Act

1966 National Historic Preservation Act

1969 National Environmental Policy Act (NEPA)

1973 Endangered Species Act, as amended

1977 Clean Water Act

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APPENDIX A

Grand Canyon General Management Plan (1995)

Excerpts Pertaining to Yavapai Observation Station Rehabilitation Project

Management Objectives (Page 7 – 8)

The management objectives for Grand Canyon National Park, which are based on the park visions, set the direction for future park management. The objectives describe desired conditions to be achieved.

International Significance

- Manage the park to preserve its integrity as a world heritage site with natural and cultural resources of national and international significance.

Natural And Cultural Resources

- Preserve, protect, and interpret the park's natural and scenic resources and values, and its ecological processes.
- Preserve, manage, and interpret park cultural resources (archeological, ethnographic, architectural, and historic resources, trails, and cultural landscapes) for the benefit of present and future generations.
- Preserve, protect, and improve air quality and related values such as visibility.
- Manage visitor use, development, and support services to protect the park's resources and values.
- Preserve and protect the genetic integrity and species composition within the park, consistent with natural ecosystem processes.
- To the maximum extent possible, restore altered ecosystems to their natural conditions. In managing naturalized ecosystems, ensure the preservation of native components through the active management of nonnative components and processes.
- Manage ecosystems to preserve critical processes and linkages that ensure the preservation of rare, endemic, and specially protected (threatened/endangered) plant and animal species.
- Protect the natural quiet and solitude of the park, and mitigate or eliminate the effects of activities causing excessive or unnecessary noise in, over, or adjacent to the park.
- Preserve natural spring and stream flows and water quality. Withdraw only the minimum water necessary to meet park purposes. To the maximum extent feasible, strive to meet increases in water demand by conserving and reusing water.
- Provide opportunities for scientific study and research focused on the Grand Canyon, consistent with resource protection and park purposes.
- Inventory, monitor, and maintain data on park natural and cultural resources and values, and utilize this information in the most effective ways possible to facilitate park management decisions to better preserve the park.
- Clearly delineate and maintain the park boundary to protect park resources and values.
- Identify and evaluate all cultural properties within the park for inclusion on the National Register of Historic Places.

- Collect ethnographic data and develop ethnohistories for the Havasupai, Hopi, Hualapai, Navajo, Southern Paiute, and Zuni peoples concerning their associations with the Grand Canyon, as appropriate, in order to preserve, protect, and interpret park resources and values important to diverse American Indian cultures, including significant, sacred, and traditional use areas.

Visitor Experience

- Provide a diverse range of quality visitor experiences, as appropriate, based on the resources and values of the Grand Canyon, compatible with the protection of those resources and values.
- Provide access that is appropriate and consistent with the character and nature of each landscape unit and the desired visitor experience.
- Consistent with park purposes and the characteristics of each landscape unit, preserve and protect the maximum opportunities in every landscape unit of the park for visitors to experience the solitude, natural conditions, primitiveness, remoteness, and inspirational value of the Grand Canyon.
- Provide equal access to programs, activities, experiences, and recreational opportunities for individuals with disabilities, as appropriate and consistent with the levels of development and inherent levels of access in areas within the park.
- Provide a wide range of interpretive opportunities and information services to best assist, inform, educate, and challenge visitors.
- Educate and influence the public through positive action to preserve and protect the world they live in, including but not limited to the park.
- Provide a safe, efficient, and environmentally sensitive transportation system for visitors, employees, and residents, consistent with management zoning and resource considerations. Emphasize nonmotorized modes of transportation wherever feasible.
- Develop visitor use management strategies to enhance the visitor experience while minimizing crowding, conflicts, and resource impacts.
- Provide visitor and employee facilities and services, as necessary and appropriate, in or adjacent to areas dedicated to those uses or in appropriate disturbed areas.

Facility Design

- Consistent with its purpose, strive to make Grand Canyon National Park a model of excellence in sustainable design and management through such means as energy efficiency, conservation, compatibility with historic setting and architecture, recycling, accessibility, and the use of alternative energy sources.
- Encourage appropriate use and adaptive reuse of historic structures, while preserving historic integrity.
- Ensure that development and facilities within the park are necessary for park purposes.
- Design high-quality facilities that exemplify visual consistency and appropriateness.
- Ensure that park developments and operations do not adversely affect park resources and environments, except where absolutely necessary to provide reasonable visitor access and experiences.

South Rim Management Objectives (Page 9)

The South Rim is considered to be bounded on the west by Hermits Rest, on the east by Desert View, on the north by the canyon rim, and on the south by the park boundary. The following objectives for the South Rim are in addition to the overall park objectives.

Visitor Experience

- Identify and develop an appropriate range of visitor experiences, opportunities, and access that will accommodate a variety of visitor expectations, abilities, and commitment levels.
- Provide viewing opportunities of the canyon, access to views and trails, and interpretation and information, recognizing that these are the most important elements of the visitor experience on the South Rim.
- Maintain the South Rim from Hermits Rest to Desert View as the focus for the majority of visitor use in the park, including major visitor facilities and accommodations.

Cultural Resources

- Utilize the extensive cultural resources of the South Rim as a strong component of the interpretive program, including the interpretation of American Indian cultures.

Development

- Develop and promote the use of foot trails, bicycle paths, and public transportation to provide convenient and efficient movement of visitors, employees, and residents within Grand Canyon Village and between major points of interest.
- Maintain and enhance the meandering, rural character of West Rim and East Rim Drives, including the feeling that one is removed from the developments of Grand Canyon Village and Desert View. Maintain the existing large undisturbed areas along West Rim Drive

APPENDIX B

Compliance

The following laws and associated regulations provided direction for the design of project alternatives, the analysis of impacts, and the formulation of mitigation/avoidance measures:

National Environmental Policy Act of 1969 (NEPA) (Title 42 U.S. Code Sections 4321 to 4370 [42 USC 4321-4370]). The purposes of NEPA include encouraging "harmony between [humans] and their environment and promote efforts which will prevent or eliminate damage to the environment. . .and stimulate the health and welfare of [humanity]". The purposes of NEPA are accomplished by evaluating the effects of federal actions. The results of these evaluations are presented to the public, federal agencies, and public officials in document format (e.g., environmental assessments and environmental impact statements) for consideration prior to taking official action or making official decisions. Implementing regulations for the NEPA are contained in Part 1500 to 1515 of Title 40 of the U.S. Code of Federal Regulations (40 CFR 1500-1515).

Clean Water Act of 1972, as amended (CWA) (33 USC 1251-1387). The purposes of the CWA are to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters". To enact this goal, the U.S. Army Corps of Engineers (Corps) has been charged with evaluating federal actions that result in potential degradation of waters of the U.S. and issuing permits for actions consistent with the CWA. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the U.S. Implementing regulations describing the Corps' CWA program are contained in 33 CFR 320-330.

Clean Air Act (PL chapter 360, 69 Stat 322, 42 USC 7401 et seq.). The main purpose of this act is to protect and enhance the nation's air quality to promote the public health and welfare. The act establishes specific programs that provide special protection for air resources and air quality related values associated with NPS units. The U.S. Environmental Protection Agency has been charged with implementing this Act.

Endangered Species Act of 1973, as amended (ESA) (16 USC 1531-1544). The purposes of the ESA include providing "a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved". According to the ESA, "all Federal departments and agencies shall seek to conserve endangered species and threatened species" and "[e]ach Federal agency shall. . .insure that any action authorized, funded, or carried out by such agency. . .is not likely to jeopardize the continued existence of any endangered species or threatened species". The U.S. Fish and Wildlife Service (non-marine species) and the National Marine Fisheries Service (marine species, including anadromous fish and marine mammals) administer the ESA. The effects of any agency action that may affect endangered, threatened, or proposed species must be evaluated in consultation with either the USFWS or NMFS, as appropriate. Implementing regulations which describe procedures for interagency cooperation to determine the effects of actions on endangered, threatened, or proposed species are contained in 50 CFR 402.

National Historic Preservation Act of 1966, as amended (NHPA) (16 USC 470 *et sequentia*). Congressional policy set forth in the NHPA includes preserving "the historical and cultural foundations of the Nation" and preserving irreplaceable examples important to our national heritage to maintain "cultural, educational, aesthetic, inspirational, economic, and energy benefits". The NHPA also established the National Register of Historic Places composed of "districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering, and culture". The NHPA requires that federal agencies take into account the effects of their actions on properties eligible for or included in the National Register of Historic Places and coordinate such actions with State Historic Preservation Offices (SHPO). NHPA also requires federal agencies, in consultation with the SHPO, to locate, inventory, and nominate all properties that appear to qualify for the National Register of Historic Places, including National Historic Landmarks. Further, it requires federal agencies to document those properties in the case of an adverse effect and propose alternatives to those actions, in accordance with the NEPA.

APPENDIX C

Foreseeable Future Actions
Yavapai Observation Station Rehabilitation Project

Foreseeable future actions were considered to be actions that could occur in the vicinity of Grand Canyon Village within the next five years which currently have funding or for which funding is actively being sought. Below are brief descriptions of foreseeable future actions that were considered during the cumulative impact analysis.

Greenway Trail – Phase III – This approximately 7-mile segment of the Greenway Trail would provide a pedestrian/bicycle/equestrian trail from the future Grand Canyon Transit Center in Tusayan (located near the Park boundary) to Canyon View Information Plaza (the new orientation/transportation hub) within Grand Canyon National Park. This trail would provide an alternative means for nonmotorized access into the Park. It would also provide a separated experience from the existing road and vehicles entering the Park. The trail would be ten feet wide with a hardened surface and a stabilized shoulder made from a mix of aggregate and topsoil. An area 12 to 14 feet wide would be temporarily disturbed during construction. Design and construction would promote sustainability where possible and would strive to minimize impacts on the land. The trail would provide a possible extension of the Arizona Trail into the Park for hikers, cyclists and equestrian users. The trail would become part of the overall trail system in the Park and would be included in routine patrols by Park rangers. Construction is expected to begin in 2003 – 2004.

Mather Point Safety and Access Improvements – Mather Point is one of the most visited viewpoints at Grand Canyon and is often a visitor's first view of the canyon. This point includes two overlooks, known as the East and West Overlooks. Both overlooks need improvements to meet current accessibility and safety standards. The pedestrian surfaces adjacent to the rim are uneven and guardrails need to be improved. In addition there is currently no access to the overlooks for visitors with accessibility issues. To address these concerns, the Park proposes to reconstruct the entrance to the East Overlook to provide a graded ramp leading to a barrier-free viewing platform. At the base of the point, the existing stairs would be removed and two new staircases would be construction to allow access to the lower portion of the point. Existing safety rails would be upgraded to meet current standards and new rails would be installed in some areas where necessary. At the West Overlook, a graded ramp would provide access to a barrier-free viewing platform to the west of the existing stairs. In some locations, vegetation would be pruned or removed to allow for better viewing from the rim. Uneven surfaces would be smoothed where possible to decrease safety hazards.

Market Plaza Shuttle Bus Stop – With the opening of Canyon View Information Plaza and the expansion of shuttle bus operations, the bus stop at Market Plaza has become ineffective. Visitors are confused by the fact that buses are traveling in two directions, but using the same stop. Westbound buses must circle through the entire parking lot in order to enter the bus stop in the proper direction. There are pedestrian/vehicle conflicts causing safety concerns in this congested area. Proposed improvements including repairing curbs, replacing asphalt, installing new benches and replacing the existing shelter. The Park also proposes to create a new bus stop across from the Canyon View Information Plaza access road and across from Yavapai Lodge. This new stop

would serve westbound bus traffic while the rehabilitated existing stop would then serve only eastbound bus traffic.

Backcountry Information Center – The Maswik Transportation Center would be renovated to function as the Backcountry Information Center. The backcountry permits office, river permits office and special use permits office and all associated storage would be consolidated into the Maswik Transportation Center. All renovation efforts would be within the roofline of the existing building and no new ground would be disturbed. Maswik Transportation Center would continue to serve as a Grand Canyon Village shuttle bus stop. Work is expected to begin in the summer of 2003.

Ranger Operations Rehabilitation – The Ranger Operations Building, a National Historic Landmark building, would be rehabilitated. Rehabilitation efforts would include such things as roof repair, log siding repair, minor site work. Interior rehabilitation would include actions such as restoration of the original lobby, restoration of original finishes, accessibility upgrades and improvements in mechanical, structural and fire safety systems. The planning and environmental documentation for this project is complete. Work is expected to begin in the summer of 2003.

Horace Albright Training Center - The Horace Albright Training Center would be rehabilitated to better accommodate current training demands and modernize the facility to meet current NPS construction standards. Rehabilitation activities would include landscaping the grounds with native plants; replacement of deteriorated concrete walkways; resurfacing of entrance road and parking areas; replacement of water and sewer lines; remodeling the interiors of five eleven-unit apartment buildings; remodeling of Kowski Hall; construction of an addition to Kowski Hall; and the construction of a storage building at the northern end of Kowski Hall. The planning and environmental documentation for this project is complete. Implementation has begun. Ground disturbance for this project is estimated at 0.25 acres.

Potential Mass Transit Options - Mass transit options for the park are currently being explored and include both light rail and bus options, or a combination of both. A transportation system may be developed from Tusayan to Mather Point and could include locations parallel to South Entrance Road. The planning and environmental documentation for this project is on-going. Implementation may occur within the five years. Ground disturbance for this project is estimated at 3 acres.

NPS Maintenance Facility - A new NPS maintenance facility is currently being constructed near the shuttle bus compound and helibase complex, and is nearly complete. This facility will consist of offices, warehouse, vehicle maintenance building, storage buildings, and a boat shop. The planning and environmental documentation for this project is complete. Ground disturbance for this project is estimated at 4 acres.

Mule Barn - A new mule barn may be constructed along Rowe Well Road. The planning for this project is currently ongoing. Implementation may occur within the next five years. Ground disturbance for this project is estimated at 4 acres.

Emergency Services Facility - This project proposes to construct a new emergency services building to house emergency medical services, structural fire protection, and search and rescue operations adjacent to the existing Clinic building. This proposal would include the construction of a parking area and access road in addition to a new building. The planning and environmental documentation for this project is complete. Implementation is expected to occur in 2003 – 2004. Ground disturbance for this project is estimated at 0.5 acres.

Non-government Housing - Additional housing may be constructed near the Albright Training Center. The planning for this project is currently ongoing. Implementation may occur within the next five years. Ground disturbance for this project is estimated at 0.5 acres.

Grand Canyon Village Restrooms - As part of a park-wide restroom rehabilitation project, construction or rehabilitation of restroom facilities may occur throughout the South Rim, including locations at **Yavapai Observation Station** (existing restrooms would be rehabilitated) and Bright Angel Trailhead in Grand Canyon Village. This would occur as part of a park-wide restroom restoration effort. Planning for this project is currently underway. Implementation would occur within the next five years. Ground disturbance for this project is estimated at 0.25 acres.

Walkways - Pedestrian walkways would be resurfaced to improve safety and universal accessibility. Walkways that would be improved include walkways around the General Store, Shrine of the Ages, and between Verkamp's store and Kolb Studio along the South Rim. The planning and environmental documentation for this project is complete. Implementation would begin in August 2003. Ground disturbance for this project would generally be on or adjacent to existing trails and walks.

Mather Campground and Mather Restroom Rehabilitation - Mather Campground would be rehabilitated. The purpose of the proposal is to provide universal accessibility and a high quality visitor experience within Mather Campground. This would be achieved through the improvement of accessible campsites, upgrading restroom facilities, redesign of the entrance area, and relocation of campsites that are close to South Entrance Road and potential transit corridors. The planning and environmental documentation for this project is complete. Ground disturbance for this project is estimated at approximately 1.5 acres. Construction is currently underway.

Pinyon Park Housing - New housing units may be constructed to replace existing trailers at the Pinyon Park housing area. Planning for this project has not yet begun. Implementation may occur within the next five years. Ground disturbance for this project is estimated at 0.5 acres.

Heritage Education Campus (HEC) - One National Landmark structure and four other National Register buildings near the powerhouse area of the historic district may be converted to interpretive and classroom space for the Heritage Education Campus. This would entail relocation of functions currently utilizing these buildings and renovation. Planning for this project has begun. Implementation of some of the first phases of this project would likely occur within the next five years. The HEC would utilize an area within the Village that is already developed with parking areas and buildings, etc. Some minor conversion of undisturbed land to developed land may result and is estimated at 0.25 acres.

Park Headquarter Rehabilitation - The Canyon View Information Plaza has replaced the visitor center function that used to occur at the park headquarters/visitor center building. This project would convert the extra space vacated by the visitor center function to administrative space, and would include additions to the building. Rehabilitation of the entire building would also occur with this project. This would include upgrading the heating and cooling systems, doors, windows, insulation, roofing, electrical, data communications, and mechanical systems. The rehabilitation would also include the installation of a fire sprinkler system and rehabilitation of the exterior to a historically accurate finish. Planning is currently underway for this project. Implementation may occur within the next five years. Ground disturbance for this project is estimated at 0.5 acres.

APPENDIX D

Cultural Resources Documentation
Summary[1] of Yavapai Observation Station National Register Nomination (1990)

Name: Yavapai Observation Station (Yavapai Point Museum)
Location: Yavapai Point, Grand Canyon National Park, Coconino Country, Arizona

Significance: "Yavapai Point Museum is of national significance in the National Park Service architecture and interpretation. The Yavapai Point Museum was designed by an architect who mastered designs that fit in with the wilderness setting of national parks. His work was the foundation and inspiration for architecture throughout the National Park Service and for CCC park structures across the nation. Herbert Maier's work blended in with the landscape by using native materials and low unobtrusive forms….The observation station was built on the brink of the canyon rim, actually following its contour (see sketch). It remains a classic example of NPS rustic architecture, enhanced by incorporating the southwestern design elements that Mary Colter used in her architecture at the Grand Canyon. The Yavapai Observation Station was one of the first formal interpretive structures in the National Park Service. The plan for interpretation at Yavapai was the work of many influential researchers and scholars. Their innovative interpretive philosophy was for the visitor to gain knowledge by observation, utilization of the displayed geographical information and discovery. The structure was built on this particular point because so much of the important geological story of Grand Canyon may be seen from here. The Yavapai Observation Station became a model for interpretive structures in other parks."

Description: The Yavapai Observation Station was designed by Herbert C. Maier and is an example of National Park Service rustic architecture….The building was completed in 1928 and was originally called the Yavapai Observation Station because of the philosophy that it was to be the mechanism for observing and understanding the geology of the Grand Canyon….the structure has distinct puebloan architectural characteristics and sits low on the landscape so that it looks almost as natural as the surrounding area…It is an irregular one-story building with an oval shape observation terrace on the north side. The building measures approximately 40 feet by 65 feet. The outside of the structure has a low profile and a flat roof. The roof has masonry parapet around it which was originally level, however, in 1930 it was remodeled by adding more stone masonry so that it appears jagged. The battered walls and buttressed corners are made of native limestone. The large vigas that protrude from the outer rock walls and the small window openings give the structure its puebloan appearance. The observation terrace is contoured to the brink of the rim, resting on a sheer wall of the canyon….Rehabilitation work in 1953 was designed by architect Kim Saunders. This work included cutting back the cantilever roof and removing approximately one course of rock wall forming the parapet. A concrete cap was then poured on top of the parapet wall to support steel frames for the plate glass windows….The rock wall that once divided the observation terrace from the exhibit room was partially removed in 1953 to allow for greater seating capacity during ranger talks…In the 1978 rehabilitation, this wall was reconstructed of rough textured plaster….A comfort station built in 1959 is the only other building in the area. This structure and the newly redesigned parking lot are noncontributing and are located outside of the historic property boundary.

[1] *= A complete copy of the National Register Nomination Form (1990) are available upon request.*